The American CINEMATOGRAPHER

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In this number

RELATIVE VALUES OF SOUND AND COLOR

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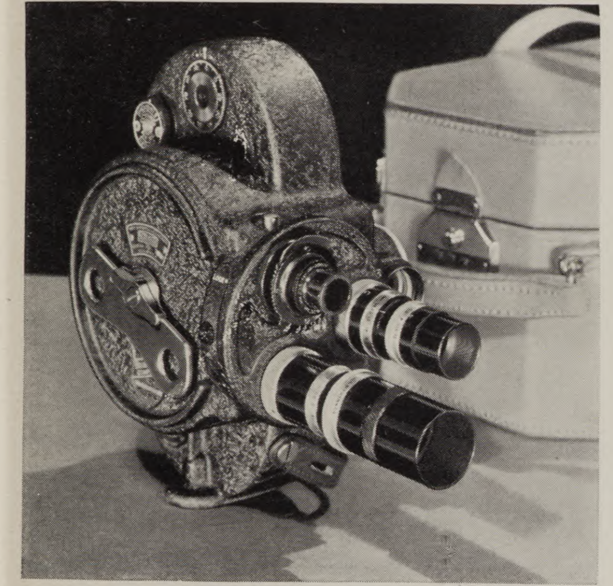

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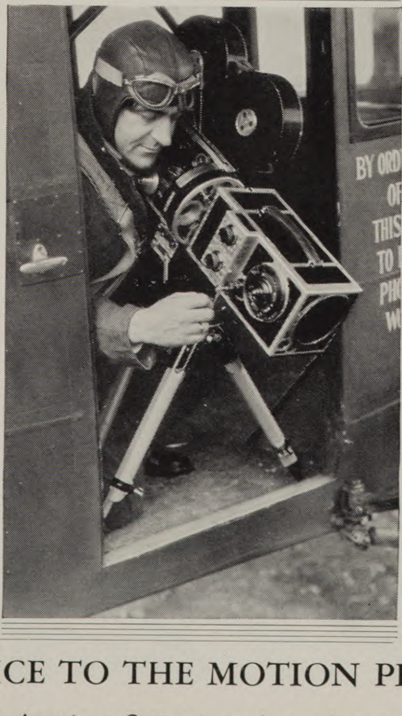

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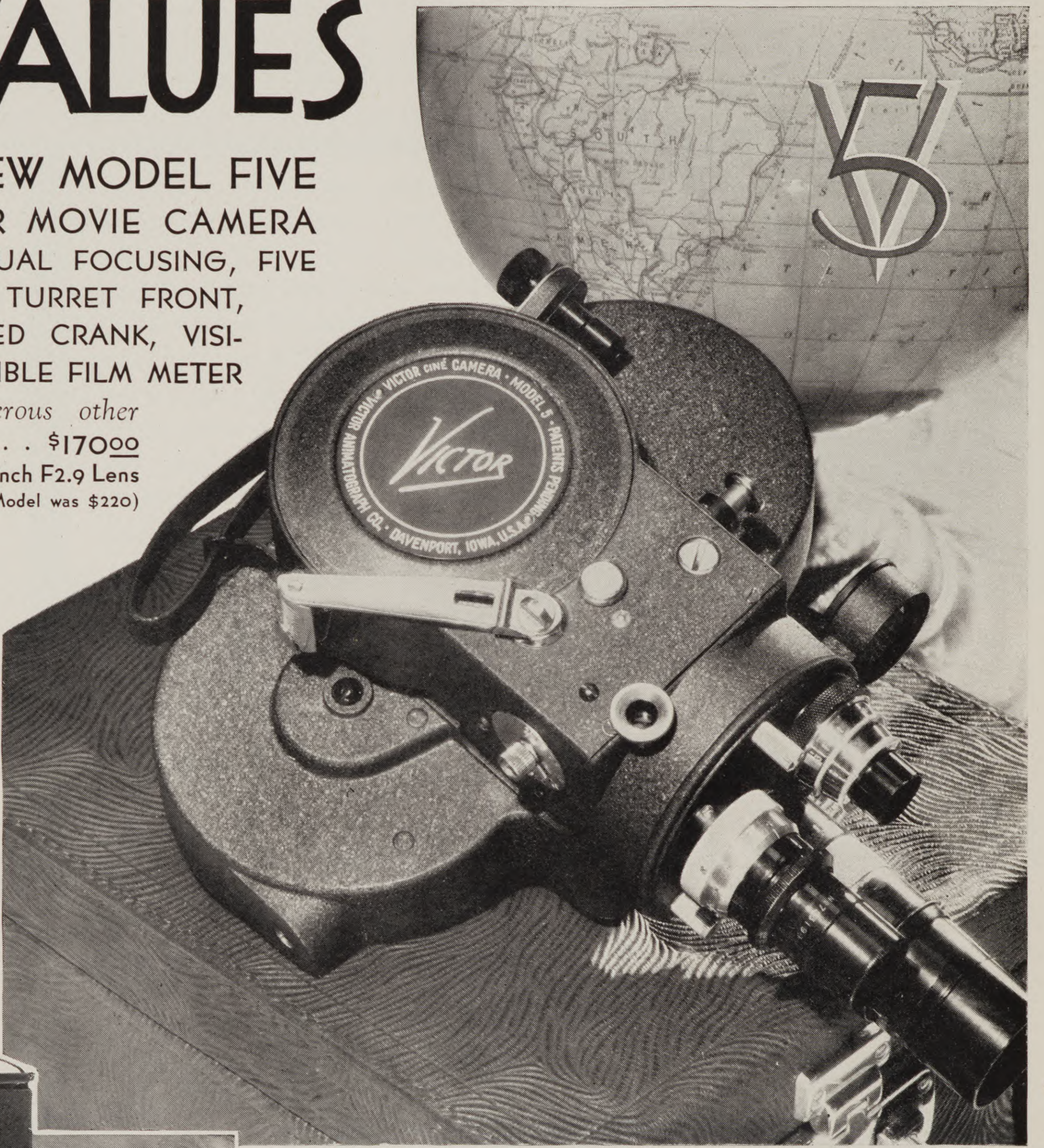
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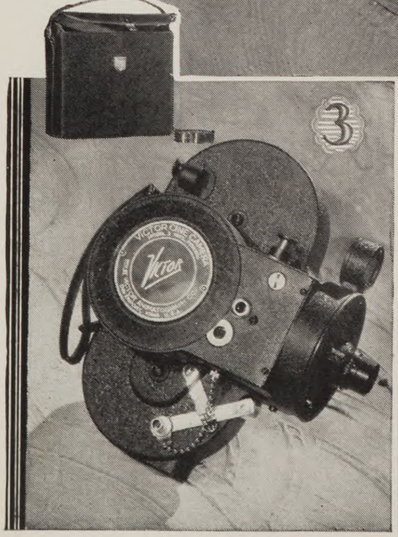

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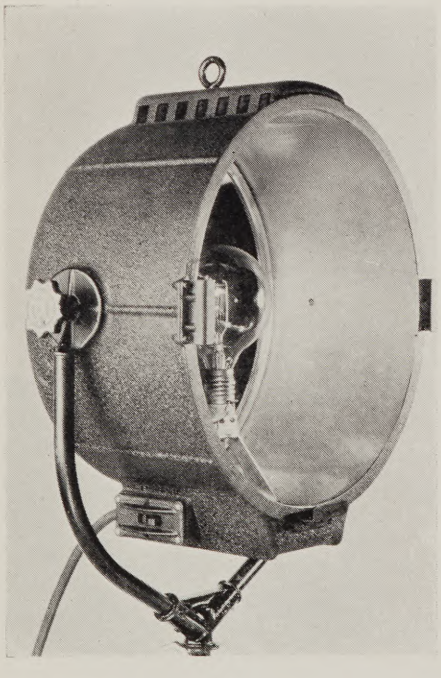

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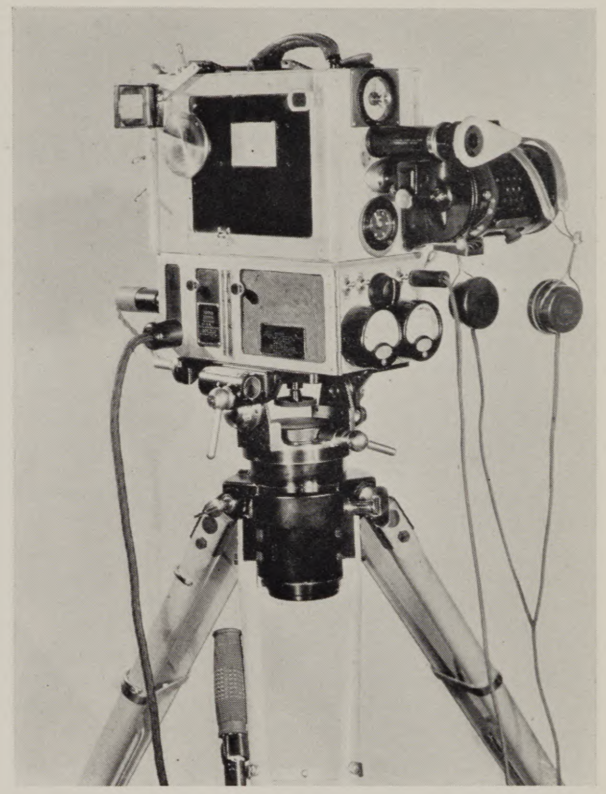

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Period Costumes for Motion Pictures

by **TRAVIS BANTON**

Chief Costume Designer, Paramount Studio

THE greatest difficulty in designing period costumes for motion pictures is not, as might at first be supposed, making them technically accurate, but making them accurate yet not laughable. Technical accuracy is not difficult: there are dozens of authoritative reference works on all periods, from the most remote to the immediate past, in every studio's reference libraries. Furthermore, no designer worthy of the name can help but be intimately familiar with the history of styles. The problem is to incorporate this easily-obtained accuracy with designs that can be worn by the modern woman, and which, when on the screen, will not seem so laughable as to detract attention from the story.

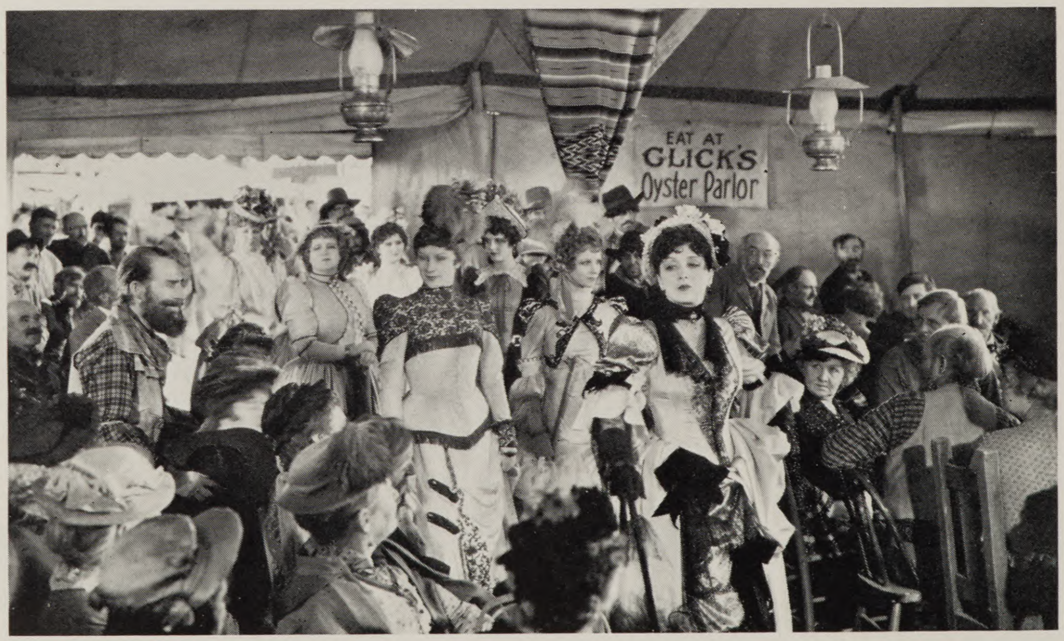
This problem increases directly as the period of the costume approaches the present. If we see a woman in the costume of the Colonial days, we consider her picturesque; if we see one in civil-war crinolines and hoopskirts, she is still picturesque, but just a trifle odd; but if we see one in a bustle, wasp-waisted corsets and leg-of-mutton sleeves, she seems hilariously funny. And yet, every now and then a scenario demands some of these styles for its feminine players.

When such a situation occurs, the costume-designer faces a threefold problem: first, he must make the costumes reasonably—or at least recognizably—accurate; second, he must make them sufficiently modernized to be acceptable to modern audiences; lastly, he must make them to the physical measurements of modern women. The first problem is historical; the second artistic and psychological; and the third purely physical.

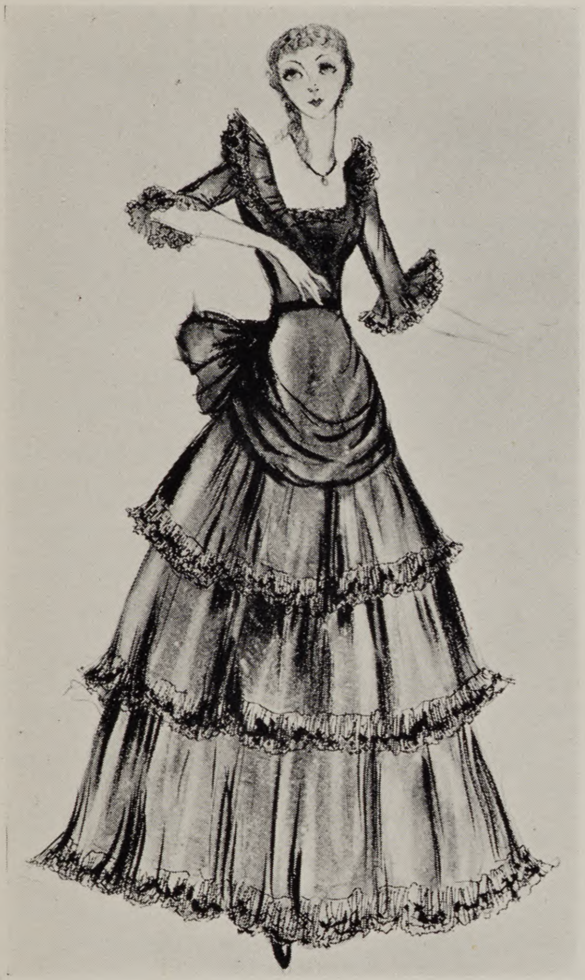
As I have said before, the first problem is the easiest. Between the reference resources of a modern studio and the personal research that any good designer must have made in the course of his preparatory studies, there is no purely historical problem extant in period costuming that can give excuse for a moment's anxiety. For the costumes of the past sixty or seventy years we have an abundance of data, not only in drawings and paintings, but in actual contemporary photographs and fashion-magazines. As we recede into the more remote periods, the data is less detailed, but no less accurate. But most important of all is the individual designer's knowledge of the history of costumes.

Feminine styles move in definite cycles. At first, it is purely utilitarian. Then it becomes more and more ornate, until finally a climax of super-ornamentation is reached, after which there is an abrupt reaction to an exaggerated simplicity, followed by a reversion to the first stage of the cycle. This is frequently—almost invariably, in fact—accompanied by a corresponding cycle of silhouettes, running the gamut from an almost modelled silhouette through a period of gross exaggeration to a reactionary shapelessness.

These cycles are, of course, directly and indirectly influenced by contemporary conditions. A retrospective glance at the fashions of the past two decades will demonstrate this. Immediately before the war we were approaching a period of extreme ornamentation, and exaggeratedly slender silhouettes. The war put an abrupt end to lavish display, and at the same time, through the emancipation of women, necessitated more utilitarian modes. The first few years immediately following the war was, in feminine style as in everything else, a period of abnormal relaxation. Styles became innocuous—almost dowdy. Then came the post-war boom, which, beginning with the exaggeration of the flapper period, built to another peak of lavishness which was interrupted by the present depression. Today the reaction is toward simplicity in design, material, and ornamentation. But—all of the styles since the war have been influenced by the new activities of womenkind; the modern woman is not only ornamental: she works, she hikes, she golfs,



An excellent example of period costuming from "Cimarron"



An 1880 period costume designed by the author for use in "Dr. Jekyll and Mr. Hyde"

she plays tennis, she swims, she rides, she motors, she flies—and as actively as any man. So her clothes must be not alone ornamental, but practical for her new activities. In the same way, though to a lesser extent, period costumes have been modified by local, national and international conditions.

But, although the matter of achieving historical accuracy in period costumes is therefore relatively easy, the matter of making them psychologically acceptable is another—and more difficult—matter. As I pointed out at the beginning of this article, the modes of the more remote periods have a certain quaint charm which makes them seem picturesque and romantic, while the modes that are relatively fresh in our memories (directly or indirectly) appear strange, and in many cases, amusing. I suppose that this is because none of us have seen the more remote ones, while many of us can still remember the more recent ones, and are more conscious of the progress since their day. No one, for instance, has seen a living dinosaur, but many of us can remember pug dogs: the thought of a dinosaur is intriguing—and that of a pug dog, laughable. So it is that in designing period costumes for motion picture purposes the designer must exercise the greatest care to keep the spirit of the relatively recent periods, while carefully avoiding the actual details which would make them laughable, for no costumes must attract interest from the story.

Two pictures which I have recently costumed have presented this problem: "Dr. Jekyll and Mr. Hyde," and "The Strange Case of Clara Deane." The former was laid in the later Victorian period; the latter covered the years between 1912 and the present. Both were intensely dramatic stories, in which any suggestion of sartorial comedy would have been fatal.

In designing the costumes for "Dr. Jekyll and Mr. Hyde," I was faced with several unusually interesting problems. Rouben Mamoulian, the director, desired the maximum of technical and historical accuracy; yet I dared not make the costumes perfect reproductions of the modes of 1880 for fear of killing the dramatic and emotional values of the beautiful love-scenes between Rose Hobart and Fredric March, and the intense drama of the many powerful scenes played by Miriam Hopkins and Mr. March. Furthermore, the styles of that period favored color combinations, and heavy, broadly-striped fabrics that would have ruined Karl Struss' beautiful photography and compositions. Therefore, I had to compromise somehow. I finally succeeded in evolving designs that were reasonably in keeping with historical accuracy, which satisfied Mr. Mamoulian, Mr. Struss, the ladies in question, and the artistic demands of both good taste and the story. If the various costumes worn by Miss Hobart and Miss Hopkins had been compared in detail with the actual modes of women in the stations of life of the ones they played, many discrepancies would have been noted. In Miss Hobart's costumes, the bustle had been almost completely suppressed, and the bulging sleeves only suggested. The bustle was hinted at by a certain fullness behind, and by ruffles and bows. The same is true of the leg-of-mutton sleeves. Miss Hopkins' part, one will recall, was of a music-hall person who was distinctly not a lady. Her costumes had to show it; therefore they were made considerably more daring and immodest than would be historically accurate. There was, to be

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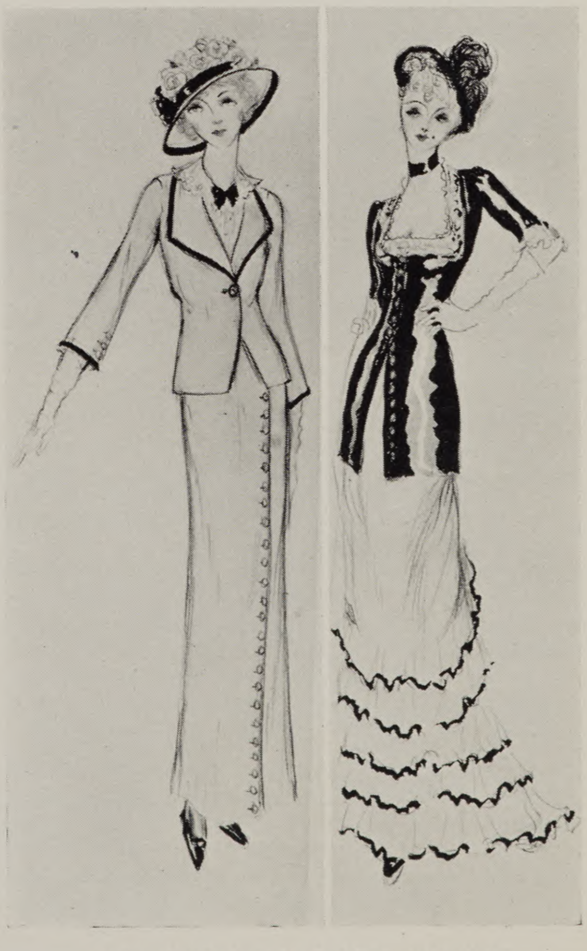

Two period designs. Left, 1912; right 1880

The Relative Values of Sound and Color

In Motion Pictures

by **DR. L. M. DIETERICH, A.S.C.**

Consulting Engineer

THE efforts of creating motion pictures, to faithfully reproduce natural vision within the limits of present methods of screen projection, are in the direction of combining sound with color.

Sound reproduction, restricted by the even ultimate possibilities of at present known methods, so far renders in its best results fairly satisfactory results.

Color reproduction up to the present has not reached even this stage of development, mainly for the reason, that the fundamental conceptions of so far known "color schemes" are, even in their ultimate possibilities, inadequate to achieve satisfactory results.

Assuming, however, that both sound and color reproductions would develop each by itself, to a condition of faithful imitation of nature, then the synaesthetic properties of human sense reaction should be well considered.

Synaesthesia in its broad sense means the automatic exciting of a sense organ by the functioning of another sense organ.

This automatic reaction is a combination of physiological and psychological phenomena.

To the knowledge of the author, synaesthesia has, as far as sound and color are concerned, in the arts, and certainly in the motion picture art, never been the basis of profound study or systematic application or use.

And yet, wherever outstanding impressive harmonies of sound and color were produced, either accidentally or by the unconscious "genius" of the human creator, then synaesthesia was active.

Before this constant repetition of that mysterious word synaesthesia, however, produces any anaesthesia in the reader, it might be well to try to clarify its practical characteristics, at least as far as sound and color are concerned and then suggest a method of application to motion pictures.

It is well known that musical arts, the sound qualities of human speech, as well as the color arts, have a decided emotional effect.

Interest, pleasure or displeasure, fascination, delight, love in its platonic or sexual beauty, or perversity—the whole gamut of emotional reactions are influenced by both sound and color.

The same effects of sense pleasure or displeasure have been and are continuously felt by all of us even under the simple conditions of looking into a store show window or listening to the radio, and in a more sophisticated endeavor, by visiting a museum of the fine arts or attending a philharmonic orchestra concert.

One of the most convincing demonstrations of the synaesthetic relationship between sound and color is the combination of a color organ display with accompanying music.

It produces an uncanny, mysterious sequence of sense emotions and can sway the mind of the audience to practically any height or depth of emotion, desired by performers of skill and thorough knowledge of psychological reactions.

It may at this point be mentioned that the comparative study of the sensitivity curves of both the human eye and ear are of great assistance in the valuation of sound and color synaesthesia, keeping in mind the influence of intensity upon the acoustic sensitivity curve under the usual rapid fluctuations of intensity in music.

Let us assume that we realize these existing and active sense reactions, then we should analyze both such sound and color reactions in order to be able to harmoniously combine them or choose the then known characteristics of one sense impression to properly co-act with certain characteristics of the impression upon the other sense, in order to enhance and not to diminish or destroy the desired effect.

It is well known, for example, that the "brilliant" hues of the warm color scale, like yellow and red, are entirely in harmony with "brilliant" martial music of strident tones and that the soothing effect of deep greens and blue-greens of the cold color scale blend well with a languid serenade. A funeral march and a gay beach scene, however, would certainly not be a pleasant combination of sense reactions, whatever the inherent beauty of either one may be.

Let us consider, as a supposition, a motion picture scene with sound and color, wherein a wharf scene is shown and wherein the dramatics call, as a pictorial detail, for an outstanding effect for a red roof and as a sound detail for the voice of a female street singer, a supposedly so far undiscovered marvelous soprano.

The art director, well versed in color effects, will, of course, make the selection of the red hue of the roof in accordance with its structure, a tile roof rather than a shingle roof for brilliance effect and select the contrast reaction of the values of surrounding objects as near as possible of complementary colors to produce the final effect of outstanding attraction concentrated upon this roof detail. This art, in short, produces in the spectator the desired dramatic effect the author strives for. This is, however, the total effect of the silent picture only.

If at the start of this crowded wharf scene an accumulation of discordant noises, with the synaesthetic impression of foul smells and dirt, impress themselves upon the spectator, the brilliance of the red roof has materially declined.

An organ grinder appears on the scene and the listener hears and is attracted by a pleasing, lively tune. The red roof immediately appears to be of a brighter hue. The street singer, clad in lively colors, starts to sing. She sings a passionate love song, supported by a marvelous voice. The red roof now appears with the same dramatic brilliance which the author and supporting art director are striving for and this brilliant effect reacts vice versa synaesthetically upon the dramatic effect of this love song and enhances the beauty effect and dramatic value of the singer's voice.

If the composer or music director, however, would be convinced that the specific star singer's voice would, in itself, be most effective in a character song of ribald drunkenness, including contrast disharmonics—the singer might be most impressive in herself—but the red of the roof would lose its brilliance, its dramatic effect would decline and, vice versa, take the snap out of the singer's voice.

If such a song, however, is a necessity, as well as the brilliance of the roof, then both effects must beforehand be stepped up in order to maintain the final cooperative dramatic effect of these two sense impressions of both sound and color.

These considerations are well in line with the dramatic art employed in properly harmonizing music and song with the libretto, scenery, and acting ability of the performers of, as an example, grand opera, but have so far been woefully neglected in the composition of colored sound motion pictures.

(Continued on Page 44)

Tinted Stock for Better Pictures

by **VICTOR MILNER, A.S.C.**

IN THE making of dramatic films, as opposed to newsreel and commercial subjects, the cinematographer finds himself dealing not so much in portraying scenes with photographic accuracy as in photographing thoughts—dramatic and emotional ideas—by means of which a story is told. To do this successfully, every possible means—mechanical, artistic and psychological—must be employed. The mechanical and artistic expedients are well known, and constantly employed by all of the leading cinematographers, directors and producing organizations; but the psychological factors are neither so well understood nor so consistently employed. This is more than merely unfortunate—it is catastrophic, for the motion picture, being essentially dependent upon emotional appeal, must necessarily depend greatly upon the application of every possible psychological trick by its makers.

One of the greatest of these psychological aids to building up emotional response is the use of color. During the decades in which the motion picture made its great development as an artistic form, a definite use was made of this, by means of tinted-base positive stock, and a definite series of emotional responses to color were established in the minds of audiences the world over. With the coming of sound, all this was swept away. The recording engineers, with their then imperfect recording and reproducing equipment and technique, found themselves handicapped by the technical limitations that the tinted positive film imposed upon them. But today, these limitations no longer exist. Tints have been evolved which do not materially reduce the efficiency of the photoelectric cell; moreover, both recording and reproducing equipment and practice have improved to a point very closely approaching technical perfection—certainly to a point at which any slight loss due to the use of tinted positive is unnoticeable.

What, then, is keeping us from once more using this provedly potent aid to the emotional phases of our pictures? Two things: the inertia inherent in the purely technical minds of our sound-departments, and a surprising lethargy on the part of the cinematographers and directors whose business it should be to insist on the employment of every possible aid to better pictures.

Fortunately, it has been my good fortune to be associated on my last two pictures with directors who understood the value of tinted film in enhancing the pictorial and emotional appeal of their productions. Therefore, in each case the director and cinematographer have presented a united front in demanding that certain portions of the production be made on tinted-base positive—and in each case, the results have more than justified the move. The quality of the sound was in no case injured; in fact, I have been told by disinterested observers that the sound in the tinted sequences was markedly superior in quality to that of the untinted ones. And the emotional appeal of the scenes was immeasurably enhanced. In a recent production from another studio, which I viewed lately, ("The Crowd Roars"), one of the most important sequences was made entirely on tinted stock ("Inferno"), with the result that the sequence was far more impressive and moving than could have been possible otherwise.

Thirty years of making moving pictures have given us at least a partial understanding of the emotional value of color, and have moreover educated the picture-going public to a definite response to certain uses of color. But the emotional response to color is of even longer standing than the comparatively short history of the cinema. As Dr. Loyd A. Jones, A.S.C., wrote some time ago, "The literature pertaining to the language, symbolism, and emotional effects of color . . . . extends over the entire period of recorded history. Mythology is replete with the symbolism of color. On the Greek stage the colors of the costumes were adjusted to the mood of the action. Color is intimately associated with the entire history of the Christian Church, and a very definite symbolism of color has been developed. Color has been so inseparably linked with sensory experience throughout the evolution of mankind that it has acquired by objective and subjective association definite and important emotional value." Dr. Jones further quotes Opie, an English artist of the 18th century: "Every passion and affection of the mind has its appropriate tint; and coloring, if properly adapted, lends its aid, with powerful effect, in the . . . . forcible expression of them: it heightens joy, warms love, inflames anger, deepens sadness, and adds coldness to the cheek of death itself."

Like all psychological factors that appeal to the subjective rather than the objective, color-reactions are somewhat stylized: they deal more with the sensation evoked in consciousness than with color as it actually is. In the use of tinted-base film for motion pictures, this must always be kept in mind. The correct tint to use for any given scene or sequence must be determined not alone by the actual coloration of the setting, but by the color-associations known to exist in the audience's mind. For instance, a scene printed on green stock is objectively correct for forest and garden scenes; but subjectively, the green connotes springtime—youth, freshness, hope, and aspiration, and may be used with such scenes, whether they be exteriors or interiors.

Similarly, sunlight is definitely suggested by certain shades of yellow, even though sunlight is, by actual spectroscopic test, not yellow, but white. Therefore, exterior scenes, or interior scenes with definite source-lightings suggesting sunlight streaming through windows, are highly effective when printed on yellow-base stock. Night interiors in which the idea of artificial rather than natural light is well established are more effective when printed on a more pronouncedly yellow-orange tinted stock (especially that trade-named "Candleflame"). Firelight may be suggested by a still more reddish tint, and actual flames by a frankly red stock. Night exteriors, whether made at night or by day, or whether they suggest moonlight or artificial illumination, are traditionally the most effective when printed on blue-tinted film. Ocean and water scenes are rendered "wetter" by the use of certain shades of blue-green. Purely scenic shots, especially of desert and cloud effects are, strangely enough, greatly enhanced by the use of certain pink and lavendar shades. These examples could be extended to an almost infinite length, but the few given here should suggest the others.

Of even greater importance is the fact that colors bring very definite emotional responses. Some colors excite, some tranquilize, and some subdue. The responses of a group of observers to these phases have been classified by Wells in the following table, which merits careful study by all directors and cinematographers:

Total number of replies from 63 subjects indicating three general types of mood-reactions due to the twelve different colors.

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Engineering Aspects of Noise Studies

by **S. K. WOLF**

Director, Acoustic Consulting Service, Electrical Research Products Inc.

BECAUSE of the intimate relation between noise and movement the machine age, in addition to major sociological and economic changes, is characterized by an amount of noise new in human experience. This is especially evident in the present motor age where our urban life with its strident, insistent hurry has noise as a predominating feature. It is also true of our factories; the impressionistic representations of industrial scenes of new thought painters should have their counterpart in weird synthetic sound patterns symbolic of the "hum of industry." A sensitive person viewing our civilization might be led to conclude that there exists a squalor of noises in a world of mechanical splendors.

Within the past few years there have appeared signs of awakening consciousness. The first eager acceptance of mechanical appliances has been tempered by a demand for silent operation in a public reaction that has been reflected in engineering circles. The engineering version of this reaction is that with which I shall be concerned here. Because of it, such typical branches of engineering as civil, mechanical and communication have had to turn their thoughts to a new field which may be called noise engineering.

Noise engineering has to do with noise in all its phases: generation, transmission, effects on mechanical and human equipment, measurement, analysis, and suppression. It is both preventive and curative in its practice, the ultimate purpose being the elimination of all harmful noise and vibration. Some of the high lights of this new field will be discussed here.

Noise we define as any undesired sound. This definition emphasizes the psychological rather than the purely physical aspects and correctly so. The physical properties of noise and music tones are very much the same in regard to measurement, transmission and absorption, hence distinction cannot be made too sharply.

Since we are concerned with the human elements in noise reduction work, it is necessary to examine briefly psychological and physiological effects of sounds. Subjective auditory response to sound stimuli is logarithmic in character, i.e., the Weber-Fechner law of sensation which applies to the other senses is true for hearing also. There is some deviation from the logarithmic relation especially at the higher and lower frequencies as the hearing mechanism is non-linear with intensity. It is also non-linear with frequency. The ear is a great deal more sensitive to low intensities from 1000 to 4000 cycles than it is at others. As the intensity is increased, the response with frequency becomes more uniform.

In addition to auditory sensation, noise also produces other less tangible effects. There are psychological elements like annoyance and mental fatigue; e. g., it is thought that pure tones of high frequency are more annoying than pure tones of low frequency of equal loudness. Recent investigations have shown harmful physiological effects of noise on brain pressure, digestive system, body recovery during sleep, etc. These consequences cannot be elaborated upon here but the noise engineer must be familiar with them in order to determine what characteristics of undesired sounds require the most immediate attention.

Noise studies proceed most rapidly when measurement of noise is feasible. Sound meters are invaluable in eliminating the human element and furnishing reliable data concerning the composition and magnitude of noise. Several types of instruments with novel design features have been devised and they shall be briefly mentioned here. The intensity may be measured either in dynes, or the logarithmic unit, borrowed from the transmission engineer, the decibel.

A comparatively simple meter is one designed to measure acoustic power directly. This type is not common inasmuch as usually we are concerned with the sensation value of a sound. A more common sound meter has a frequency weighting characteristic similar to the loudness level curve at 40 db. To simulate the ballistic characteristic of hearing it is designed to give maximum response only for sounds of more than a fifth of a second duration. The maximum intensity for which it will function is about 500,000,000 times the minimum, an enormous range for an instrument, but not so great as our ears can accommodate. The ideal for this type of meter, complete correspondence between its readings and the response of the average human ear is far from realization. Nevertheless the instrument is most valuable in engineering studies on noise and noise reduction.

Another type of instrument is the harmonic analyzer. Applied to noise the name is something of a misnomer for the meter will indicate components having no harmonic relation to each other. Such analysis is desirable to aid in locating the sources of troublesome components. The analysis may be broad, i. e., the entire acoustic spectrum may be divided into 3 or 4 parts; or separation between components relatively few cycles apart may be had. One type harmonic analyzer is based on the heterodyne principle in order to secure uniform and high selectivity, with electrically resonant detector circuit. It is interesting to note that today mechanically resonant elements are sometimes employed in place of electrical circuits in such analyzers.

Since noise in modern life is, in one sense, largely due to the engineer, it seems fitting that the engineer should now concern himself with ameliorating existing conditions. The program adopted by the noise engineer to war on noise may be classified into fields related to the several branches of engineering. The first principle of the noise engineer, avoidance of its generation, is highly applicable in other fields, mechanical engineering being the most prominent. If our machines can be made silent in operation, the first great step forward will be realized. Factories, offices and homes even can be quietly peaceful compared to present conditions. The transportation fields offer great possibilities in this respect. Automobiles, subways, trolleys and aeroplanes are all noisy but are all undergoing study and improvement. The second principle of the noise engineers to avoid sound and vibration transmission, is obviously important to the construction man and also to the mechanical engineer. It is the duty of architects and builders to supply substantial sound-proof buildings. To keep out noise, homes of the future may employ windows for light and observation only, air being obtained through auxiliary, sound-proof inlets. The third principle, to absorb sound, has its application after other principles have been tried. The ventilating expert uses it to produce silent ventilating ducts and window attachments, and there are other similar uses for diminishing the intensity and sensation value of noise.

How is the above program being carried out at the present time?

I feel that I am not being too optimistic when I say that progress is being made all along the line. Automotive engineers are giving us the silent second and vibrationless motors and motor suspensions. Recently in New York City

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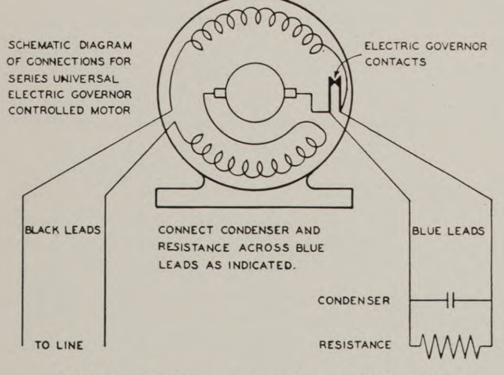
Speed Control

by **E. H. HANSEN**

THE problem of running separate mechanical devices synchronously has been one of the earliest, since the combining of electro-mechanical arts. In the entertainment field, the introduction of talking pictures brought out the necessity of synchronizing camera and sound recorder operation.

The attempt by Edison, in 1904, of course, lacked primarily the thermionic amplifier, for suitable reproduction. The belting and flexible shaft arrangement of Edison, between the projection booth and the mechanical reproducer on the stage, automatically took care of synchronization, despite the physical difficulties incurred. In production, Edison, of course, used a similar mechanical arrangement in connecting the picture camera and the wax recording machine.

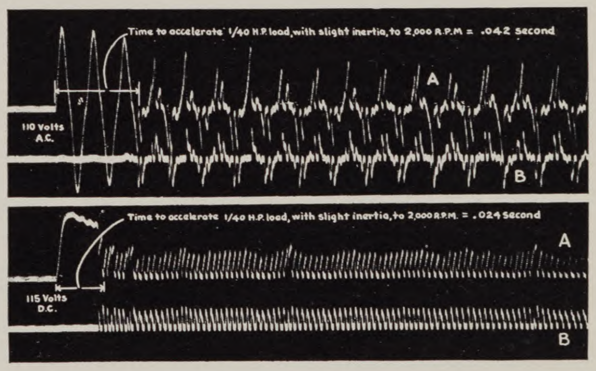
Synchronous motors have been utilized for synchronous driving since the beginning of alternating current power systems, and like many other fields of endeavor, the talking picture has adopted, to a great extent, this elemental method. The simplicity of merely connecting two synchronous motors across a common source of power supply is very appealing, were it not for the fact that it does not answer the problem of electrically inter-locking camera motor systems, so that they may be brought from a standing start to full speed, and then stopped in interlock. The interlock motor control system has application, not only to production recording, but also in dubbing, re-recording, and scoring. In many of our studios today, it is no uncommon practice to find from six to eight projection machines, re-recording machines, and sound recorders, electrically interlocked. Mechanical attempts to place various machines on a common shaft, or by means of jack shafts and chain drives, have not met with approval, due to the lack of flexibility, and the physical difficulty inherent when machines are widely spaced.



Centrifugal governor speed controlled motor

Some of the early applications of the electric interlock, or Selsyn motor, was in the driving of steel mill equipment, the gate motors of the Panama Canal, and Directorscope fire control systems on board our battleships. These systems are identical to the Selsyn motors used in studio production, except for the increased power output.

In sound recording, the addition of a speed control unit to the master motor of a Selsyn system was to be expected. The necessity of maintaining not only good motion in a projector or sound recorder, but also controlling its speed, so that a standard could be maintained, was apparent from the beginning. As late as 1927, different film speeds were employed by the major talking picture producers of that time. The DeForest system operated at eighty feet per minute. The Fox Movietone system operated at eighty-five. The Warner Brothers disc was geared to the film, so that thirty three and one third R.P.M. was obtained when the film was passing through the aperture, at ninety feet per minute. A consolidation finally provided a standard film speed of ninety feet per minute, or twenty-four frames per second. Early sound on film talking picture production utilized equipment similar to that now used by the newsreels, namely, the sound was recorded in the picture camera, and required simultaneous processing. The drawbacks of this simplified system are well known, and it was soon apparent that the advantages of double system recording would ensure the adoption of this method. Both the Selsyn and synchronous motors were quickly adopted. In the case of the synchronous motor, the ratio of gearing, and the consistency of frequency of the power supply circuit, was depended upon for speed control.



Performance curve of centrifugal governer type motors

In conjunction with the Selsyn drive, there was brought out at this time a method of DC speed control, which would control a master DC motor driving the master Selsyn motor, and a very high degree of speed regulation was provided. This was called the tuned control method, and employed an alternator on the common shaft with the master Selsyn motor, which supplied an alternating current of 720 cycles, which was fed into a filter rectifier system, so that during periods of the control motor slowing down, less field current was applied, and during overspeed periods, a greater field current was introduced into the control field windings of the control motor. This system depended only upon the accuracy of the filter cut-off, and has proven to be one of great stability, despite a rather complicated and bulky electrical arrangement.

During the past two years, a very light weight synchronous control method has been developed. This is known as the DC interlock method, wherein a DC motor and AC generator are combined on one shaft, so that with the AC windings of independent motors interconnected, they will run in synchronism. These motors, however, usually do not have any speed control method, other than a field rheostat controlling the shunt field windings of the DC motor. The AC windings do not become energized until they attain nearly normal speed, so that the interlock feature is only effective after all motors are running at nearly normal speed. This type of interlock system is much more efficient, from a power consumption standpoint, than the true AC synchronous methods, and the drive motors for the various photographic, or recording, units, may be operated on dry cells of the "B" battery type, providing an extremely flexible power supply.

AC and DC motors have been available for many years, incorporating a centrifugal switch on the shafts, cutting in and out a series, or field resistance, by the governor action. With careful regulation a fair amount of speed control is obtainable by this method. It will be apparent, however, that the control action does not operate until the motor speed has reached critical points at top and bottom. The result is that if carefully analyzed, it will be found that the speed characteristic chart comprises a continuous cycle of peaks and valleys, with the motor at no time remaining in mid-portion. The main drawback to governor control DC motors lies in the response time period.

A more constant and accurate means of controlling motors, either for DC interlock, or DC master control methods, is that of an additional field winding, having its current controlled by means of a tuning fork. Current is supplied to this control field winding through a commutator, which, if out of phase with the tuning fork, makes no contact, and permits the motor to speed up. Upon speeding up and coming into phase, a commutator contact is made, and a small amount of controlled field current is applied, holding the motor to a slightly slower speed. It is necessary, in the primary adjustment, to set the regular

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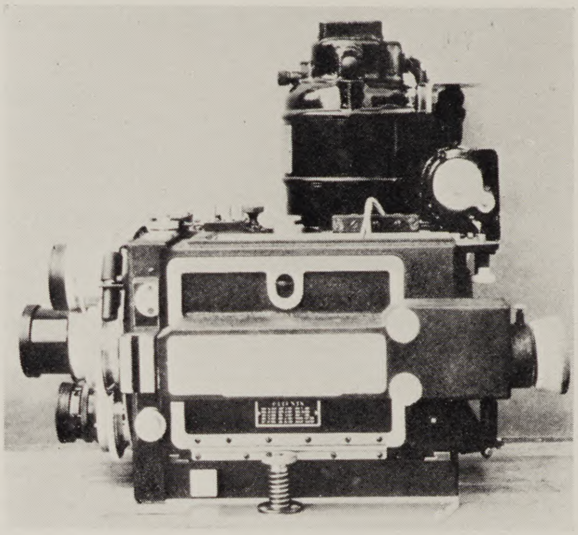
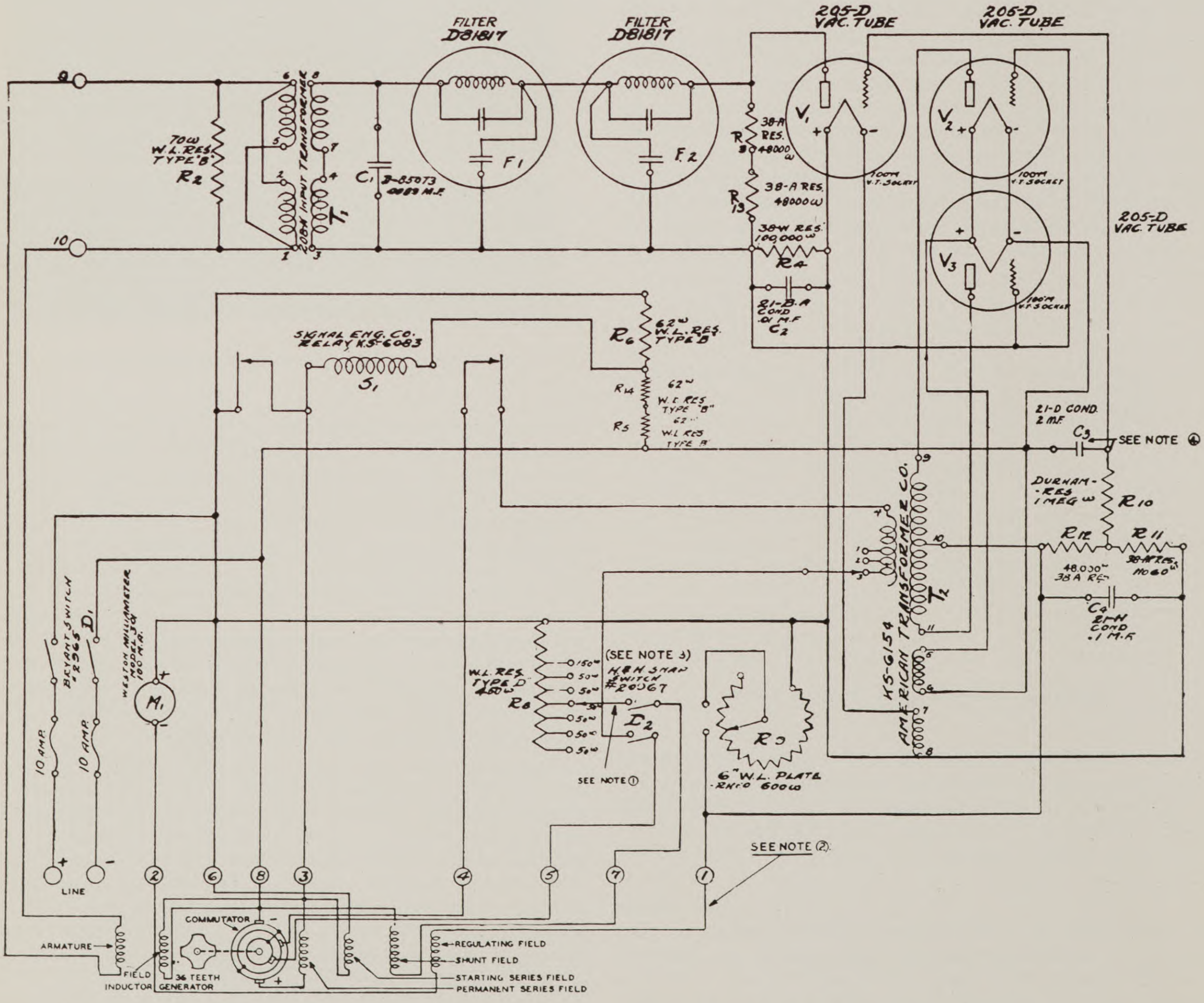


2400 R.P.M. Selsyn camera motor mounted on a Mitchell camera



Schematic drawing of tuned control speed regulation circuit

Size of Image

As a Guide to Depth of Focus in Cinematography

by **J. F. WESTERBERG, A.S.C.**

IN A. C. Hardy's paper on "The Depth of Field of Camera Lenses," which appeared in the S.M.P.E. Journal of March, 1931, several questions were brought up that merit discussion from the point of view of practical cinematography.

The common misunderstanding in regard to the terms "depth of focus" and "depth of field" was mentioned, and also the question of whether in motion picture photography the size of the permissible circle of confusion should vary or remain constant. The most significant point that was brought up, however, was the relation of magnification to depth. The simple rule, that depth varies inversely as the square of the magnification, may prove to be a very practical yardstick in the appraisal of depth in photographing near-by objects. In the past, too many factors have been involved to warrant any other method than direct visual examination of the image on the ground glass.

Depth of Focus Vs. Depth of Field

It is common practice among photographers to refer to all problems of depth by the expression "depth of focus." Strictly speaking, depth of focus should only be used in referring to the leeway that one has in focusing upon an object at a fixed distance. Thus, under certain conditions, if it is desired to focus at 15 feet, a satisfactory image may be obtained of an object at that distance if the point of sharp focus falls anywhere between 13 and 18 feet.

Depth of field, on the other hand, assumes that the lens has been focused correctly at the desired distance, in this case 15 feet, and indicates that all objects between 13 and 18 feet would be in practical focus.

It is doubtful if in most cases cameramen actually adjust to the exact focus, especially when following focus. Depth of focus is, therefore, an ever-present life-saver. When attempting to focus so that objects both near and far shall seem sharp, it would be technically exact to say that depth of field is under consideration, although practically it is much simpler to retain the term depth of focus in an all-inclusive sense.

Fixed Circle of Confusion

It is well known that in still photography a larger circle of confusion can be tolerated when the picture is big and the lens of long focal length than when the picture is small and the lens of short focal length. Big pictures are usually looked at from a distance, while small pictures have to be examined close at hand. It is assumed, therefore, that in still photography the size of the permissible circle of confusion may vary directly as the focal length. A value of 1/1000th of the focal length is the accepted figure. This works out, for example, as 1/100th an inch for a ten-inch lens and 1/250th an inch for a four-inch lens.

Can this line of reasoning be followed in the case of a motion picture? Apparently not, because the size of the picture and the viewing distance are constant for any one spectator. The fact that the faces on the screen vary in size is evidently immaterial in this case.

The result of allowing a sliding scale is quite apparent to the eye when looking through a camera. The longer focal lengths, on the one hand, do not live up to their higher rating and the wide angle lenses, on the other hand, have depth to spare. A fixed circle of confusion of 1/500th an inch seems to be about correct in practice. This is 1/1000th of the focal length of a two-inch lens.

Size of Image A Measure of Depth Capacity

Hardy's proposal to consider depth as a function of the magnification has practical possibilities that should not be ignored. Nearly all the scenes in a motion picture are made at close range, somewhere between a full-length figure and a close-up. The subject of depth becomes greatly simplified when we consider, for instance, that the depth in photographing a waist figure is always practically the same for any given stop, regardless of the focal length of the lens used. With this in mind it becomes possible to construct a table in which any reference to focal length or distance of object becomes superfluous. This simplifies matters considerably. All that remains to consider is the stop and the magnification. The stops are easily read, of course, and the magnification can be readily estimated with sufficient accuracy by reference to the ground glass.

Relation of Depth to Magnification in Motion Picture Lenses

Image Data Based on aperture 0.6×0.8 of an inch			**Total Depth** At least one-half of total depth available beyond plane of critical focus				
Magnification	**Height of Subject Included at Point of Focus**	**Character of Scene**	**F/2**	**F/2.8**	**F/4**	**F/5.6**	**F/8**
1/11.2	6.7 in.	Insert of hands	1.0 in.	1.4 in.	2.0 in.	2.8 in.	4.0 in.
1/15.6	9.4 in.	Action insert	2.0 in.	2.8 in.	4.0 in.	5.6 in.	8.0 in.
1/22.4	13.4 in.	Large head	4.0 in.	5.6 in.	8.0 in.	11.0 in.	16.0 in.
1/38.7	23.2 in.	Close-up	1.0 ft.	1.4 ft.	2.0 ft.	2.8 ft.	4.0 ft.
1/46	27.6 in.	Bust	1.4 ft.	2.0 ft.	2.8 ft.	4.0 ft.	5.6 ft.
1/55	2 ft. 9 in.	Waist figure	2.0 ft.	2.8 ft.	4.0 ft.	5.6 ft.	8.0 ft.
1/65.5	3 ft. 3 in.	Cutting at hips	2.8 ft.	4.0 ft.	5.6 ft.	8.0 ft.	11 ft.
1/77.5	3 ft. 10 in.	Hands showing	4.0 ft.	5.6 ft.	8.0 ft.	11 ft.	16 ft.
1/90.7	4 ft. 6 in.	Cutting at knees	5.6 ft.	8.0 ft.	11 ft.	16 ft.	22 ft.
1/110	5 ft. 6 in.	Cutting at ankles	8 ft.	11 ft.	16 ft.	22 ft.	32 ft.
1/130	6 ft. 6 in.	Full length	11 ft.	16 ft.	22 ft.	32 ft.	45 ft.
1/155	7 ft. 9 in.	Medium long shot	16 ft.	22 ft.	32 ft.	45 ft.	64 ft.

The above table illustrates the simplicity of this method when used for motion picture work. Purely minor variations such as the effect of distance on the f/ value have been completely ignored. It is hoped in this way to make the table simple enough to be of some practical use in production. A table of this sort should prove useful in many ways.

(1) It indicates at a glance the capacity in regard to depth of any particular set-up.

(2) It indicates to what extent stopping down the lens will improve depth.

(3) It indicates to what extent a larger stop is justified under any given circumstances.

A table like this, based on magnification of the image, should make it possible for any one to obtain an accurate yet simple grasp of the depth situation in photographing near-by objects with a motion picture camera, and to know, without difficulty, how much depth can be relied upon and utilized in any given case.

(This paper was read before the S.M.P.E. Fall meeting and appeared in the Society's Journal—Editor.)

New Perambulator and Camera

Features at Academy Technicians' Meeting

UNDER the chairmanship of Virgil Miller, the newly-formed photographic section of the Technicians' branch of the Academy of Motion Picture Arts and Sciences recently held an interesting meeting and exhibition of new cine-machinery at the Paramount Studio. Quite a variety of new and recently-developed apparatus was on exhibition, and each was briefly explained during the meeting by its maker. Undoubtedly, the main centers of attraction were the new Bell & Howell perambulator (unofficially christened the "Rollambulator" during the course of the evening), the new Fried "Photo-Effect Camera," and the new Tally camera, described in detail in a recent issue of "THE AMERICAN CINEMATOGRAPHER." Other devices shown included blimps, tripods and cranes developed by and now in use in various studios, new lenses, etc.

The new "Rollambulator" is one of the most practical devices yet introduced for the prevalent moving-camera technique. In addition to the usual pan-and-tilt movements, and the horizontal movement provided by its wheeled construction, there is also a vertical movement which enables the camera to be raised or lowered from a lens-position approximately 24 inches from the ground to nearly eight feet. The perambulator movement is hand-powered, and on small, rubber-tired wheels. The pan-and tilt movements are manual, and controlled by a positive and silent hydraulic resistance. The vertical movement on the present model is by a vertical worm, which may be cranked by an assistant, with the crank placed either by the camera-head or on the base of the perambulator; in either position, this crank positively locks out the other crank. An hydraulic hoist is contemplated for the vertical movement of future models. The panoramic movement is, as has been said, hydraulically controlled, and is normally operated by the feet of the cinematographer, who sits on a seat mounted so as to revolve with the camera, and pushes with his feet upon a convenient, circular track on the base of the device. The tilt is controlled by a lever that is placed convenient to the cinematographer's hand. The "Rollambulator" has been, we understand, developed primarily for use with the silent camera which its makers are developing, but it is sufficiently strong to accommodate the heaviest and bulkiest blimps now in use.

The Fried "Photo-Effect" camera is one of the most unusual devices thus far developed. Briefly, it consists of two Bell & Howell cameras, mounted directly above each other, and connected by a bellows. The film passes through this bellows, and is exposed in both cameras. The two cameras may be panned and tilted separately, and the images may be focused singly or together, by means of an unique duplex focusing tube, by which the two images may be brought into exact register. According to Armin Fried, its designer, this camera is intended to supplement process shots, enabling the cameraman to achieve these effects at a single exposure, with the minimum of time and effort expended. In practice, the lower camera is used to photograph the foreground action, and the upper one to photograph the background. Different focal-length lenses may be used, and the background may be either a straight or

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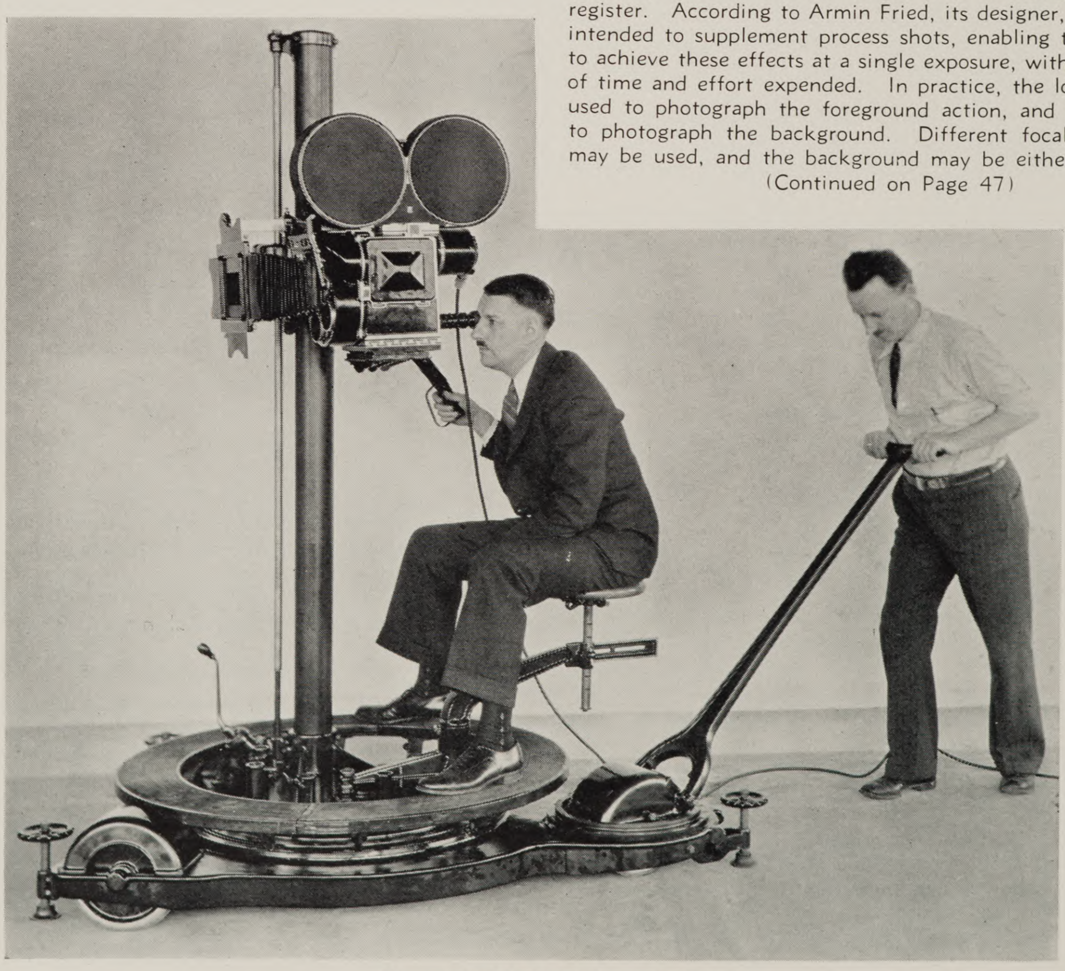


The new Bell & Howell perambulator

Sound Recording: Art or Trade

by **L. E. CLARK**

NEARLY three years ago, during the course of the series of lectures on Sound Recording given by the Academy of Motion Picture Arts and Sciences, I said, "With such an imposing array of reasons why motion pictures are hard to make, one can but wonder at the future of the sound picture, and particularly at the future of the engineer who was thrown into the motion picture business as a result of sound. If the motion picture is going to continue to live, it must be as an art and not as a science, and accordingly the engineer must become something of an artist. It will be with sound as it was with photography. Cameramen have their individual peculiarities. There are certain men who excel in the art of photographing certain stars, and there are other men who confine their particular attention to action photography or to scenic photography. Each man has his own particular set of equipment for his camera—special filters, special lenses, diffusion discs and related devices. The future sound engineer will do likewise. He will have his special circuits, his special frequency characteristics, let us say, with which he can improve the voice of an actor far beyond its natural state. Certain of the mixers will excel in closeup sound, certain others will excel in other branches. One possibly may become an expert in recording exteriors. And so it goes. Sound recording will soon become more and more of an art, and less and less of a merely technical operation."

Since then, time has proven me wrong. Instead of becoming more and more of an art, sound recording has become more and more of a routine, technical job. Artistry has been lost in a maze of decibels. The sound man, as an individual, is scarcely more important than the gaffer, the grips, the projection-machine operator, or the extra players that dress the set. All that is asked of a sound man is that he be able to run the sound equipment passably, and get along with the director and cameraman. Whether he is an artist or a mere dial-twister does not matter particularly.

A very concrete proof of the status of the sound man is the fact that in all but one or two studios the individual sound-man who records a picture does not get screen credit. When screen credit for recording is given, it goes to the department head instead. This is in direct contradiction to both studio practice and common fair play. In other departments of production, screen credit is given to the men actually responsible for the work. Cinematography is not credited to the director, nor is direction credited to the producer. The head of the camera department is not given credit for photographing the productions photographed by his subordinates, nor is the head of the story department credited with writing the stories upon which he passes. Therefore, it is unreasonable to bestow the credit for recording a picture to another than the man who actually does so. But there is still another reason for giving the individual recordist the credit that is his due: the personal incentive that such screen credit will give him—arousing in him a new, personal interest in his work—an earnest desire to do his work better, to prove his individual technical and artistic worth to his superiors, his fellows, and the world at large.

But, after all, this situation is directly the fault of the sound men, individually and collectively. Our work is scarcely less important, and demands no smaller combination of technique and artistry than that of the director and cinematographer. But we have deliberately allowed the industry as a whole to overlook the individual and artistic sides of our contributions, and relegate us to the status of ordinary, skilled workmen.

The cause of this goes back to our entrance into the motion picture industry. Very few of us were originally from the studios; we came from the electrical laboratories, from the telephone companies, from radio broadcasting studios and chains, and from engineering colleges. We knew little or nothing of conditions within the motion picture industry—and cared little about them. We were engineers—and proud of it. Our business was to install and operate the recording equipment, not to make pictures per se. We were not particularly concerned with the artistic phases of picture-making, either immediate or potential. We were not interested, either, in the rewards (other than financial) of motion picture making. Our job was to install the recording systems in the studios, to overcome the technical problems incident to making talking pictures. How well we overcame them is attested by the present-day activities of every studio; but we are now paying the price of our initial attitude. We came into an artistic business, to work among artists—but we ignored the innumerable signs that clearly told us that we, too, must become artists. We were scientists—and scientists we would stay. Art had no part in science, so we shut our ears to its possibilities and invitations. We ignored the fact that we had left the laboratory, not for the routine technical job of installing and operating telephone circuits, but for the infinitely complex and potentially artistic task of creating by means of modified telephone circuits the audible part of the most imaginative entertainment the world has ever known.

Today we are paying the piper. We are still sound technicians, it is true; but we are regarded as only technicians—not as artists. We record what is played beneath our microphones—and are satisfied. We seldom, if ever, think of suggesting ideas for the artistic betterment of either sound-recording or its dramatic utilization. We are technicians! Who expects us to have any ideas on art?

And yet, every day when we go on the set, we are faced with the embarrassing spectacle of a technician who is also an artist, and recognized as such: the cameraman. He is a technician to his finger-tips; his work is no less technical and scientific than is ours. He must know photography, photochemistry, photographic optics and mechanics and the physics of light-waves just as we must know electricity, transmission circuits, recording practice and the physics of sound-waves. He must be a super-skilled technician, for his work is exacting, and allows even less after-control and modification than does ours. But—in addition to being a technician, he is an artist. He is keenly alive to the artistic possibilities of cinematography. He studies each scene—each sequence, not alone as a routine problem in photographic technique, but as an individual problem in cinematic art. When he sets up his camera and arranges his lights, he does so not merely so as to make an exposure possible, but to bring out in the most effective manner the qualities of the set, the players and the action in the particular dramatic mood set up by the story requirements.

In doing this, a good cameraman invariably does many things not included in the ordinary requirements of strictly technical photography. He will overlight or underlight his sets for special effects. He will choose unusual angles of view. He will employ diffusers, gauzes, gauze mattes, and a score of similar devices to bend the normal actions of his camera and lenses to his will. And he will constantly strive to develop new artistic conceptions, and new technical devices to make them possible.

(Continued on Page 32)

HAL HALL
says

Appreciation

EVER notice how people in this funny old world of ours seem to be looking only for an opportunity to adversely criticize their fellow men? Guess it must be one of those human failings that have been passed along since the beginning of mankind; a failing that has broken many strong hearts and has lost money for many of the criticizers.

Most of us like a pat on the back now and then, especially when we have done a particularly fine piece of work—whether it be writing a story, directing a picture or selling a bill of soap. If the boss gives his employee a compliment and a smile, that employee will give his boss still better work, finer results—it is human nature. However, it seems the rule among this gang of humans to forget the good things, the excellent work and accomplishments, and to see and speak only of the mistakes and the failings. What a pleasant world it would be if expressions of praise and appreciation were passed on with the bitter and biting criticisms.

◆

What Do They Want?

ONE of the things that is most difficult to understand in this queer picture racket is the matter of new talent. Everyone in Hollywood knows that there are literally thousands of individuals out here who have good looks, personality, ability—but who are just extras with perhaps an average of two days' work per week throughout the year. Starvation wages at best. Producers, film executives—all send out the cry for all film hopefuls to stay away from Hollywood. Right.

But—in the same breath these same people broadcast the news that they are sending men to the far places of the earth in a search for new talent, new faces, etc. Figure it out for yourself, if you can. It has this writer stumped. Anyway—take a tip from us—don't head towards Hollywood these days expecting to crash the studio gates in any line. If you have any kind of a job back in the home town, hang onto it.

◆

16 Millimeter

FROM Germany comes a report that should be food for thought for exhibitors throughout the world. The Deutscher Schmalfilm Dienst has been established in Germany for the purpose of showing programs on 16 mm. film in the small towns and villages. Operators will be stationed at various points throughout the country, each one visiting twelve villages by motorcycle at fortnightly intervals, showing full length programs corresponding to 10,000 feet of standard sized film. Educational films will be shown at schools at a moderate charge.

The 16 millimeter field has been enlarging quite rapidly during the past couple of years. Already the 16 millimeter equipment has made itself felt and its worth well known in the industrial field. It is only a question of time until it begins to creep into the amusement field. And, why not? This is a world of competition. If amusement can be provided by means of the narrow film it is up to the makers of professional entertainment films to meet that competition. Perhaps we may have better pictures as a result. Who knows?

Ruinous Ballyhoo

THE following article appearing in the May 21st issue of the Hollywood Herald should be read by everyone in the picture industry who has the welfare of the industry at heart. At least, that is this writer's personal opinion. No added comment is needed.

" 'This industry is its own worst enemy' quoth Sidney R. Kent in his address to the Academy and, as usual, the old Roman is right. If the present session of Congress enacts a revenue law putting a tax on theatre admissions above ten cents we shall have nobody to blame but ourselves.

"For years we have pursued a publicity policy within this industry that was headed, inevitably, for disaster. Never was an opportunity lost to broadcast to the world the stories of our reckless extravagances. From the housetops we shouted about the enormous salaries of our chosen, lucky few. With the world aflame with the deadly virus of starvation and want; with more than 8,000,000 unemployed in this country alone—25 per cent of our total working population—we stage, if you please,—a 'gala premiere' for all the world to see and to marvel. We take the occasion to exhibit to the onlooking mob our costly furs, our gorgeous jewelry, our ritzy motors and our glamorous ladies. We illuminate the skies with a hundred Kliegs and employ the facilities of a nation-wide broadcasting system in order that millions outside Hollywood may share the envious reactions of the local gang of onlookers—'admirers,' we call 'em—who stand huddled behind the police ropes.

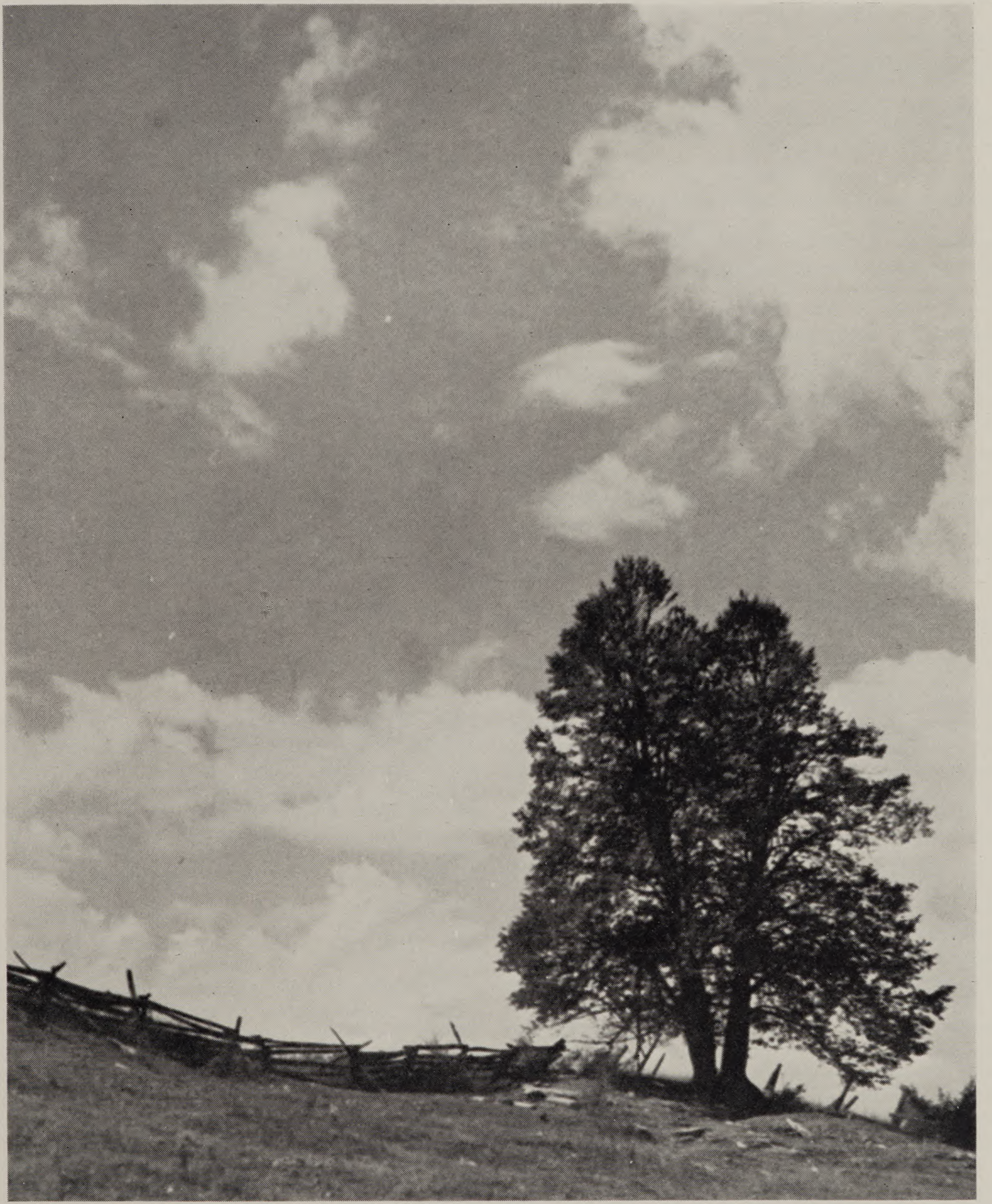
"And the very next meeting of the Senate Finance Committee at the nation's capital amends the House legislation by fixing the admission tax on tickets at ten cents—instead of the House rate of 45 cents!

"One young man in our midst chucks his job because the $1,400 a week offered him is not enough. An executive earning close to $2,000 a week refuses to accept a 'cut' and sulks in his tent. A newspaper columnist is offered a contract for four weeks' work on a picture at $50,000 and the fact is duly recorded in newspapers throughout the land. A studio expends $125,000 on a production in excess of its allotted budget and boasts about it in the trade papers. A musical comedy star, in Hollywood to do a picture, is reported in the public prints as due to receive $15,000 and a split over the house average for a week's appearance at a motion picture theatre in San Francisco. And all of this in the face of the most widespread industrial depression this nation ever has witnessed!

"Some folks among us seek to argue that all this talk about big money is thoroughly orthodox from the standpoint of up-and-at-'em showmanship. If this be so, then let us face the facts and be prepared to accept the consequences. If, on the other hand, this is not the case, let us put a stop once and for all to this stupid type of ballyhoo. Certain it is that we cannot retain both the penny and the cake. Either we can afford to accept this ruinous taxation and make the most of it, or we cannot afford it. And if we cannot afford it, let us leave no doubt of that fact. The best way to clarify the situation is to stamp out entirely anything that even smacks of dollar publicity."

"Vanity"

Sophie L. Lauffer, F.R.P.S.



The three charming photographic studies found on this and the opposite page were made by Bruce Lindsay, of Windsor, Conn. Above—"Twin Maples." Upper opposite page—"Hill Road." Lower—"Contentment." These pictures entered in this magazine's pictorial competition.

Period Costumes

(Continued from Page 9)

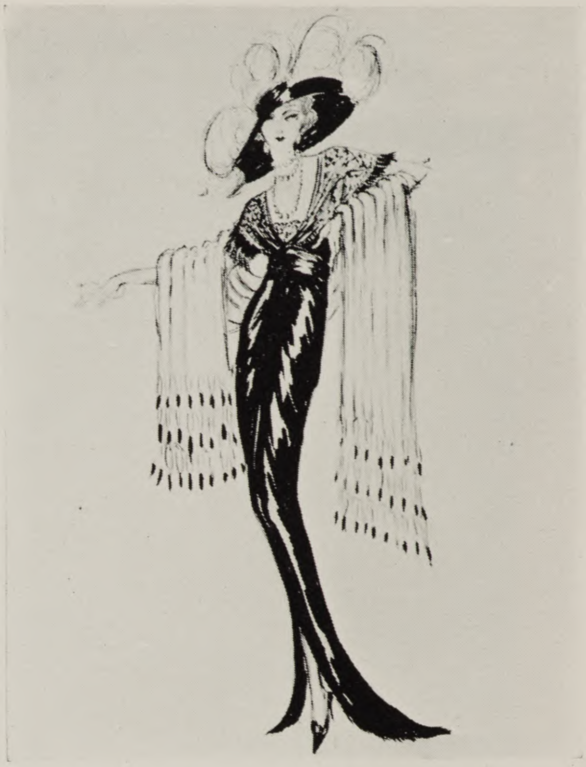
specific, a great deal less at either end than would have been considered proper, even for such an improper person, during the '80s. In one sequence in the cafe, she wore a hat that was, properly speaking, several decades earlier than the rest of the costume—almost the Empress Eugenie style, in fact. But it was sufficiently modified to be both in keeping with her character (and the mood of the sequence) and with modern ideas. I doubt if any hat of the actual period would have been compatible with these requirements.

In designing these various costumes, we attempted to aid in characterizing the players—in making their roles stand out in contrast from each other—by the costumes. This was largely achieved by the differences in design and materials. Miss Hobart's costumes were simpler in design, and more graceful than were Miss Hopkins.' The fabrics used in Miss Hobart's costumes were largely of solid colors, and the whole struck a reserved note. The fabrics used for Miss Hopkins' costumes were relatively loud, and were rather profusely ornamented with lace and gaudy ruffles, striking a gauche note more appropriate to the gamine. Miss Hobart's costumes concealed her figure; Miss Hopkins' accentuated hers.

The costumes for "The Strange Case of Clara Deane," being of more recent periods, which are still fresh in the memories of most of us, could not be so greatly modified. Fortunately the story, being biographical, permitted an almost photographic accuracy of detail. Therefore, Wynne Gibson's costumes—as well as those of most of the feminine players—were almost perfectly accurate technically, the chief modifying influence being the purely photographic requirements incident to any motion picture.

The third problem I have mentioned—making the costumes look right on the figures of modern women—entered the case in both pictures. Such experiences give one a new respect for the human framework. It is amazing how cruelly some of the fashions of the past have distorted the shape—not only the outline, but the actual shape of the human body. The modes of the period in which "Dr. Jekyll and Mr. Hyde" was laid required a large bust, a wasp waist, and exaggeratedly large hips. These contours were further exaggerated by the full sleeves, be-ruffled shoulders, extremely low necks, and ungainly bustles of the period. These are the direct antithesis of modern modes; accordingly, the figures of modern women have changed to conform with the style. Miss Hobart is an excellent example of the difficulties we encountered in this respect. She is, physically, a typical modern woman: slender, but possessed of a decidedly natural, healthy figure. Therefore the problem of costuming her so as to even suggest the unnatural silhouette of the period was extremely difficult. Of course, good, Victorian corsets formed the foundation: but even with their aid, her waist was inches larger than was proper back in 1880. Therefore, we had to do the rest with puffs, ruffles, bows and padding. And—we had to do this so that the result on the screen would be both natural-appearing and yet satisfactory to modern audiences! The problems that we encountered with the extra players—who, of course, had to be costumed economically—can be imagined.

The problems encountered in the earlier sequences of "Clara Deane" were of a different nature. In 1912, the silhouette was svelte and encased in sheath-skirts. One didn't walk in them—one undulated. From the designer's viewpoint, it was exceedingly difficult to design such costumes so that they would appear accurate, and yet at the same time be graceful on modern women. I imagine that the casting director had more than a little trouble finding players who could wear these styles satisfactorily, and that the director had quite as much in making them appear natural in them—especially, to move naturally in the hobble-skirts, after so many years of broad, short skirts.



An authentic 1912 design used in "Clara Deane"

The designing of period costumes is, of course, influenced by many of the same factors as is the designing of costumes for any production. The costumes must fit the story, the situations and the sets. There is almost invariably insufficient time allowed to prepare them for use, and too little opportunity for cooperation with the art and camera departments. Costumes are all too frequently approved and ordered one day for use the next; the real heroines of most pictures are the patient women who slave all night to have the star's costumes ready to wear on the set for an eight o'clock call the next morning. Then, too, the stylistic requirements of individual stars must be kept in mind. Some stars require certain materials, certain types of design; others require definitely different types. I cannot dress Marlene Dietrich, for example, as I would Frances Dee, or yet Claudette Colbert. Miriam Hopkins requires different styles from Sylvia Sidney—and Carole Lombard and Jeanette MacDonald require still different types of costumes. These requirements must equally be borne in mind in designing period models. By these requirements, of course, I refer to the actual stylistic needs, and not the personal preferences of the individual players, which must, too, be considered to a greater or less extent. These personal preferences are sometimes helpful in designing ordinary costumes, but are very rarely so in the case of period designs, which require a specialized knowledge that the average layman does not have.

And yet, despite all of these difficulties, I enjoy costuming a period film. Perhaps it is because period productions are relatively rare, and afford a diversion—a break in the regular routine. Perhaps it is because they offer new problems, totally different from the film-costumer's usual task of creating new variations of current modes, and outguessing the fashions of six months from now, when the film will be released. At any rate, it is a field that offers great possibilities and unbounded interest.

Concerning Cinematography

Critical Comments on Current Pictures

by **WILLIAM STULL, A. S. C.**

GRAND HOTEL

◆ It is not unusual to find a production in which one or two out of the many elements that go to make up a motion picture may be termed perfect, but rarely indeed do we find a film like "Grand Hotel," in which every phase—technical, artistic and executive—is uniformly and superlatively perfect. "Grand Hotel" exemplifies what motion pictures can be at their best: a great story, perfectly cast, lavishly and intelligently produced, with all of the technical and artistic phases not alone individually brilliant, but perfectly coordinated. Sufficient acting talent for a dozen "super-specials" has been combined in this one production: yet the story gives each star an ideal part for his or her talents, and Edmund Goulding's well-nigh flawless direction has evoked a great performance from each player. But, in so far as this department is concerned, it is the perfection of the technical details that is of paramount importance. Never before have I seen a picture in which the contributions of cinematographer, director, art-director and costumer were so perfectly coordinated. The work of each was individually brilliant; but this is often the case: what makes "Grand Hotel" so unusual is the fact that each of these several artists has seemed to be working with a perfect understanding of the ideas of the others, and together they have set a new high standard for technical perfection.

Cedric Gibbons' conception of the settings could not have been improved upon. Architecturally, they are most distinctive, as his sets always are; but—what is far more important—they are perfectly attuned to the moods of the scenes played upon them, to the costumes worn by the players, and to the photographic requirements of the story. The costumes designed by Adrian are equally well-matched to the sets, the players, the photography, and the story. The direction, as remarked before, is dramatically brilliant—but more than this, it takes full advantage of the possibilities of the sets, and allows the photographer a perfect chance to express the artistry that is William Daniels'.

As to the photography itself, such an artist as Mr. Daniels has proven himself to be could hardly have erred with such opportunities as the players, direction, sets and costuming of "Grand Hotel" provide; but Daniels has done more than this—he has excelled himself. He has not only made each scene artistically and technically brilliant, but he has perfectly matched the dramatic mood of each scene with every detail of his camera-craft. His compositions and lightings are flawless; his use of angles and camera movement, perfection. It must be mentioned in this connection that the director wisely left the matter of moving shots entirely up to Mr. Daniels: the result should be studied with care by the many directors of lesser calibre who so frequently attempt to conceal their directorial shortcomings with a reckless over-indulgence in camera-movement. The trucking-shots in "Grand Hotel" are cameraman's trucking-shots: not one of them is used except for a legitimate dramatic purpose; none of them merely to give movement to the picture, or to provide synthetic "originality." The same applies to camera-angles. Mr. Daniels deserves an additional palm for his intelligent use of these tricks—and Mr. Goulding another for giving his co-worker a free hand in this delicate phase of cinematography.

But it is in the less obvious phases of his work that Mr. Daniels has reached his greatest heights. "Grand Hotel" strikes a wide variety of emotional and dramatic moods as it unfolds its story, and the plot-construction requires a great deal of intercutting of these. The manner in which Mr. Daniels has met this artistic problem has never been surpassed, and seldom equalled. It is difficult enough to sustain the simpler dramatic moods of an ordinary feature—and so, Mr. Daniels' achievement in sustaining the photographic uniformity of his picture while matching the infinitely varying emotion keys of "Grand Hotel" deserves praise of a more than superlative order. He has used every artifice known to cinematography in so doing—yet without conveying the impression of artifice at any time. "Grand Hotel" should be studied by every cinematographer, professional or otherwise, the world over.

BERLIN—DIE SYMPHONIE EINES GROSSTADT

◆ Correctly speaking, a picture that was made in 1926, and never released in this country, has no place in this column; but "Berlin—the Symphony of a City" is a film which should be studied by every cinematographer, director, writer, cutter and producer in the industry. It was made some years ago, by Karl Freund, A. S. C., and was shown at the May meeting of the American Society of Cinematographers through the courtesy of the Fox Studio, whose library contains the only print of this film in America. Every one whose business is the making of motion pictures should see it.

SOCIETY GIRL

◆ There are certain cinematographers of whom you can almost invariably expect outstanding cinematography. One of these is George Barnes, who photographed "Society Girl," but this picture does not reveal Barnes at his best. He has achieved many individually fine scenes, but has erred in attempting to set too widely divergent photographic moods for the two principal characters—a society girl and a prize fighter. The moods that he has set for these two opposing ideas are in themselves excellent, but when used together, and intercut, they make the picture as a whole unpleasantly uneven and spotty.

THIS IS THE NIGHT

◆ This is another frothy little musical romance of the Lubitsch school, and, as such does not offer spectacular opportunities for photographic originality. But in it, Victor Milner, A. S. C., one of the few real masters of the art of photographic lighting, has achieved some of the finest lightings ever seen in this type of picture. The film's real claim to importance, however, is the manner in which Frank Tuttle has utilized sound—especially in the opening sequences and the baggage-men's chorus. He has developed and improved upon the ideas suggested by Lubitsch and Rene Clair, and brought the perfect sound-film, in which sound is used more for cinematic effect than for dialog, many steps nearer actuality. Several sequences in this picture, too, are printed on tinted-base positive, to excellent advantage.

AN APOLOGY

◆ In my review of "The Lost Squadron" last month, I mistakenly credited the excellent process work to Lloyd Knechtel. I have since learned that Vernon Walker, A. S. C., was responsible for this work. My recollection of the picture is that Mr. Knechtel received screen credit, presumably as department head. As I know Lloyd too well to imagine that he would want credit for the achievements of his co-workers, I can only blame the lamentably unfair system now in vogue in most studios, whereby in such cases as special effects, recording, etc., screen credit is given to the department head, rather than to the subordinate actually responsible. Let us hope that this will soon be remedied. In the meanwhile, both Lloyd and Vern remain outstanding in their work, regardless of the allotment of screen credits!

. . In the Realm of Sound . .

Wide Range Recording and Reproducing Announced by Erpi

WIDE Range Recording and Reproducing, the newest and most advanced development in talking picture recording and reproducing, has been formally announced by Electrical Research Products. It will be available in the near future to exhibitors and producer-licensees using the Western Electric Sound System.

Wide Range Reproducing alone was given its first public demonstration in a theatre before a specially invited midnight audience at Fay's Majestic, Providence, R. I., the second week of May. The installation has since been maintained and is being used at the regular performances in the house.

Wide Range accomplishes what scientists and engineers have been striving for for a considerable time, namely, an extension of the frequency and volume ranges of sound that can be recorded and reproduced. With the Wide Range System the frequency range is extended to cover from as low as 40 to as high as 8,000 cycles.

The chief claims made for the resulting sound are a quality never hitherto reproduced, greater naturalness, intimacy, an easier intelligibility of dialogue and a more thrilling effect of great volume free from any distortion. With Wide Range it is possible to record and reproduce the extreme soft sounds of whispered conversation or the individual instruments of an orchestra together with the heaviest passages that were formerly precluded by the limitations of existing recording and reproducing systems.

Wide range has been made possible by a refinement of recording and reproducing apparatus. The chief change in the latter lies in the introduction of a new high frequency loud speaker unit capable of reproducing even beyond the limits of audibility. Certain other modifications in the reproducing system are also involved.

The demonstration at Fay's Majestic assumed additional importance not only from the enthusiasm and prestige of the invited audience but also from the sentimental interest in the fact that the Majestic was one of the first theatres to show talking pictures. It was equipped for sound on December 25, 1926.

The advantages of Wide Range reproduction evidenced at this demonstration will become even more pronounced, it is claimed, after motion picture studios have completed the installation of equipment for Wide Range recording. The equipment for modifying a studio recording channel for Wide Range involves no major changes except the substitution of the moving coil microphone for the present condenser type microphone and the addition of simple electrical networks. High quality monitoring is also necessary.

An interesting feature of the demonstration at the Majestic is the fact that the installation was "tailor made." The equipment and installation were adapted specifically to fit the physical and acoustic characteristics of the house.

This innovation introduces the policy of recognizing a theatre's individual characteristics and will be adhered to, Electrical Research Products officials state, in all Wide Range installations.

Pre-Set Fader Stop Put Out by GoldE Co.

A PRE-SET fader stop, a device for providing instantaneous changeover with inequality of volume, has been put out by the GoldE Manufacturing Co. of Chicago, and is being distributed by the National Theatre Supply Co.

The device consists of a friction stop with a projecting arm. The stop slides on a ring before the face of the fader and may be placed in any position around the full circle. The arm carries a rubber cushion which contacts the fader-pointer and arrests it at the pre-set positions as the pre-set fader stop has no pins, holes, rachets or other fixed-position arresting devices. Speed is another claim made for it by the manufacturer in that a word may be taken half from one reel and half from that following without interruption and with no difference in volume.

The pre-set fader stop is attached only by the lower faceplate screws on Western Electric Faders, the company declares, making unnecessary any alterations of the fader. Attachment is made in about five minutes. Prevention of sudden blasting is claimed because overrunning is prevented, and diminution of volume caused by stopping short of the correct number and creeping up to it, it is claimed.

Novel Film Amplifier From Samson Electric

A NOVEL amplifier for use as portable or permanent booth installation of sound-on-film talking picture equipment known as the "Cine-Pam," is being put out by the Samson Electrical Co. of Canton, Mass. Any panel of the device, it is said, can be removed by taking out 4 screws without breaking a soldering connection as all connections are made with flexible wire and plugs. Tubes can also be exposed for easy replacement through this unique method of panel removal.

The device is 28¾ inches long, 20¼ inches high, 10¼ inches deep, weighs 104 pounds and comes provided with two 15-foot lengths of shielded cable from photo cell in the sound head to the amplifier which can be increased to 25-foot lengths if desired without any noticeable loss in high frequencies, the company declares.

The Cine-pam is entirely AC operated and supplies photocell voltage and exciter lamp current.

Photo-Electric Cells

DESIGNED of tested materials and offered in all types and sizes, a line of photo-electric cells that are declared to have achieved ultimate present-day protection is being put out by the Telephoto & Television Corp. of New York. Sensitive to the highest degree, they reduce the amount of amplification required for tonal reproduction obviating to a remarkable extent the possibility of distortion, the company claims.

Shield For Projectionist

A LIGHT shield for Simplex mechanisms, consisting of dark ruby observation glasses on both sides, and provided with a pilot lamp, enabling the projectionist to thread the film in frame before starting without having to look at a blinding spot, is being marketed by the Walter G. Preddy Co. of San Francisco.

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S. M. P. E. Convenes in Washington

MORE than two hundred technicians and research specialists of the motion picture industry gathered in Washington, D. C., the second week of last month for the four-day semi-annual meeting of the Society of Motion Picture Engineers. The meeting, first under the presidency of Dr. A. N. Goldsmith, was held at the Wardman Park Hotel and was one of the most successful and enthusiastic in the history of the organization.

As is always the case at these S.M.P.E. meetings, a very brilliant group of technical papers was read at both the morning and afternoon sessions. Educational topics and 16 millimeter cinematography were given a very prominent place among the papers and discussions. Four papers by C. L. Greene, H. Pfannenstiehl and R. A. Miller, H. C. Holden, R. G. Tasker and A. W. Carpenter served to bring home to those in attendance the importance of the 16 millimeter development. The Standards Committee which has been working on standardization of 16 millimeter dimensions, gave a report which was referred back to the committee for further consideration.

An unusually interesting paper on "Recording Artificial Speech in Motion Pictures," was presented by C. W. Barrell of the Western Electric Company. In this paper it was pointed out that for the first time motion picture recordings have been made of human speech re-created by an artificial larynx. A brief description was given of the mechanical voice box which replaced the natural larynx when that organ had to be removed by surgery. An excellent motion picture showing just what had been done, was shown in conjunction with the paper.

Kurt Schneider, of the Oehler Machine Company, Astoria, L. I., presented a paper on "A New Light Control for Printing Machines" which described a device for automatically controlling the intensity of the printing light so that successive scenes of each print receive respective exposures which have been previously assigned to them. Another paper was given on "Extension of Film Recording and Reproduction" by G. L. Dimmick. This paper was of unusual interest, pointing out that improvements have been made in recording of sound-on-film and in the reproduction of sound from film which has resulted in an extension of the frequency range and in the volume range. The paper explained that the low frequency range has been extended by the use of a loudspeaker unit which gives good response from 60 cycles to 10,000 cycles. The high frequency range has been extended by the use of a ribbon type microphone and by the reduction of film attenuation. The use of a narrower recording slit and a large mirror galvanometer have improved the high frequency response from the film, and the ground noise reduction system is simplified and made more effective.

H. C. Holden in a paper on "A 16 MM. Sound-on-film Projector," described a talking picture equipment suitable for the non-theatrical field, and gave a brief review of the problems involved in obtaining a sound record of good quality on the narrow film. Another paper by W. F. Bonner and B. F. W. Heyer, dealt with the "Application of Rectifier Power Supply to Sound Reproducing Equipment," and Lieutenant C. E. Fraser gave a paper on "Motion Pictures in the U. S. Navy." This paper brought out the interesting fact that the navy now owns 467 features and is procuring an average of 25 features and five shorts monthly.

Stanley Sumner of the University Theatre, Cambridge, Mass., in a paper on "The Film Problems of Theatre Operation" brought out the fact that the condition of film after about thirty days on the road is not all that could be desired. Many valuable suggestions were offered in the matter of handling the films by exchanges and theatre shipping departments. The new Bell & Howell fully automatic sound and picture production printer was adequately described in a paper by A. S. Howell, B. E. Stechbart and R. F. Mitchell. Another paper by A. Warmishan and R. F. Mitchell described the new Bell & Howell Varo "zoom" type lens. This paper was accompanied by a reel of pictures made with the lens and showing what can be done with it in practical work.

In a paper by E. W. Beggs of the Westinghouse Lamp Company, on "Standardization of Picture Projection Lamps" it was pointed out that 130 types of picture projection lamps are required today to fill the demands. Mr. Beggs made a plea to the Society of Motion Picture Engineers to attack the problem of standardization in this field so that an ideal set of lamps may be decided upon and better results be secured at less cost.

W. C. Jones and D. T. Bell then gave a paper describing an ingenious device called "The Lapel Microphone." Many speakers, they explained, find it difficult to use the conventional type of microphone because of the restrictions it imposes on their freedom of movement. A microphone has been designed to be worn on the speaker's clothing. The new microphone is such as to provide a vibratory structure of low mass and stiffness which resonates at a comparatively high frequency. The resilient support for the diaphragm also adds sufficient mechanical resistance to prevent a prominent peak in the response at the resonant frequency. Means are also provided for reducing extraneous noise to a minimum. A part of the sound reaching the microphone is due to body vibration. This sound, they explained, is rich in low frequencies and must be attenuated, otherwise the quality of transmission will be unnatural. This is accomplished in the design of the coupling transformer. This transformer, together with the apparatus required for suppressing clicks, indicating when the circuit is in operation, is mounted in a control cabinet. A flexible cord connects the microphone with the cabinet.

"Biplane Filament Construction—The New High Intensity Incandescent Light Source" was the title of a paper given by J. T. Mili, of the Westinghouse Lamp Company. The following abstract gives the highlights of the paper fairly adequately:

"Manufacturers of motion picture projectors have been continuously demanding increasingly brighter and more uniform light sources. The biplane staggered filament construction, consisting of two parallel rows of coils, so placed that the coils in one plane fill the spaces between coils in the other, is now being presented as the lamp manufacturer's answer to this demand of the industry. A report is presented on comparative tests made with monoplane and biplane filament lamps ranging in wattage from 200 to 1000, with several types of optical systems. These tests show that:

(1) The average brightness of a biplane light source is approximately double that of a monoplane source of the same wattage.

(2) With any projection lens system a biplane filament may be expected to give about 50% increase in screen illumination over a monoplane filament of the same size and coil brightness. This of course involves doubling the wattage.

(3) The increased uniformity of the biplane filament makes possible more efficient condenser designing, since the periodic variation in intensity across the source is decidedly less with the biplane than with the monoplane.

(4) With most of the existing Kodacolor projectors an appreciable increase in illumination and greatly improved and more uniform appearance may be had by the use of this new source.

(5) With the biplane filament small variations in the lamp, mirror, and lens settings such as met in actual practice are about half as serious as with the monoplane.

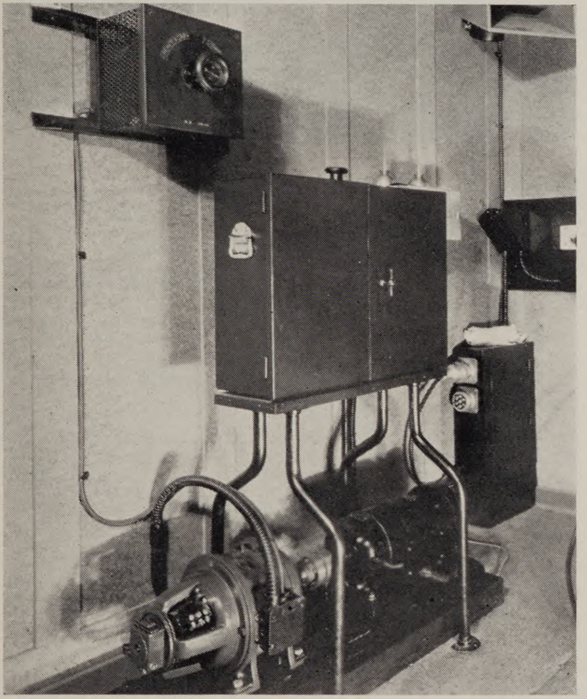
(Continued on Page 49)

Speed Control

(Continued from Page 14)

motor field rheostat at a point where the motor has a tendency to run slightly above normal speed.

The difference between this and the governor control methods is that a correction is applied, at approximate intervals of one one-hundredth of a second, instead of one correction every few seconds. It is apparent that no extreme peak or valley can be reached in this low period of time, so that a characteristic graph will show as a straight line. An alternate method of fork control is provided in having the fork control through the AC torque. Both methods are highly satisfactory, and will maintain speeds to within one one-hundredth of one percent, or to one part in ten thousand.



Tuned control, master motor, 720 cycle generator and distributor Selsyn as used in major studios today

In controlling the speed of compound wound direct current motors by the use of a commutator and tuning fork, in series with the control field windings, interlocking of additional motors is accomplished by a master controlled motor, having a commutator for each motor so controlled. This method eliminates the losses incurred in combination AC DC motor generators, and provides interlocking at the full efficiency of the DC motor, and at the cost of DC equipment.

In general, a speed control and interlocking system should preferably be one wherein the correction time factor occurs at no greater intervals than one one-hundredth of a second. Any changes which occur in shorter periods than this will not be noticed by the audience.

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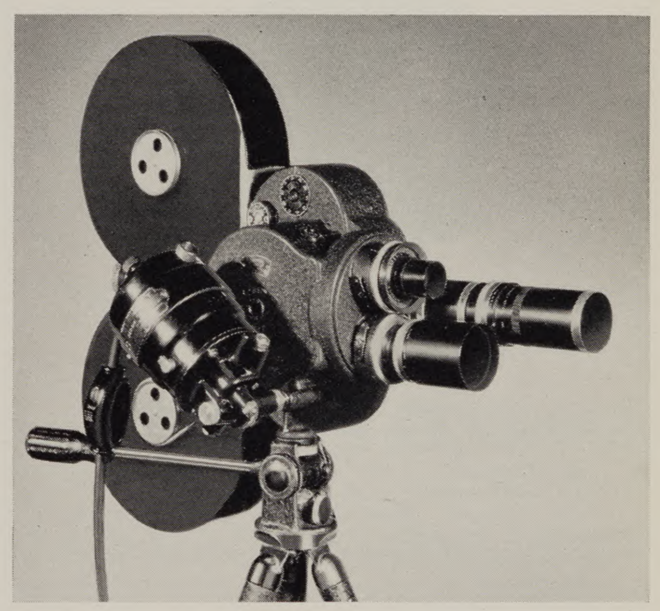
Portable 35 MM. Movie Camera With Electric Motor

TO MEET special demands for airplane motion picture work and for outfitting scientific and exploring expeditions, the Bell & Howell Company has arranged to equip its portable 35 mm. Eyemo movie camera with an electric motor. Also an external film magazine carrying 400 feet of film can be added.

In airplane photography the motor feature is particularly desirable in that the pilot can place the camera with attached motor in an advantageous position and shoot pictures by remote control.



The Eyemo with electric motor

Any Eyemo camera employing a hand crank can be motor equipped. The motor is mounted on one side of the camera, engaging in the hand crank socket. The motor runs the film through at speeds of from 24 frames down to 4 frames per second, the speed being adjusted by the camera governor. The motor weighs only 3⅞ pounds, and inasmuch as the camera only weighs 8½ pounds, the combined weight of the motor and camera is such that an aviator or explorer will find that taking this type of 35 mm. equipment along does not involve any appreciable weight factor.

When an external film magazine is not attached, the film is run from a 100 foot spool in the camera itself, as formerly. If desired the motor runs the entire 100 feet of film through without stopping.

Either a 12 or 110-volt motor can be adapted to the camera. The 12-volt motor is particularly practical for airplane work as this current is available from the plane batteries. Current for the 12-volt motor can also be supplied by auto batteries on exploring expeditions.

The motor is readily attached to the camera and just as readily detached. When it is not desired to use the motor, the camera can be operated by spring drive while held in the hand—the usual manner of operation—or it can be set on a tripod and operated by hand crank. Thus a high degree of utility and flexibility is combined in a unit of surprisingly small weight.

The Eyemo camera has long been a favorite for motion picture work where standard size film is desired and where a regulation professional camera is not feasible due to its bulk and weight, or other reasons. The new motor development adds another desirable feature to the Eyemo as does also the external film magazine.

NEW -:- NEW -:- NEW

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EXPOSURE METER

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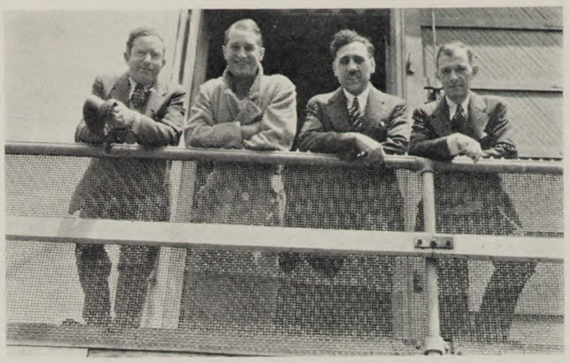
Four Good Fellows



An informel shot of Maurice Chevalier and three cameramen, snapped at the Paramount lot in Hollywood. At Chevalier's right is Victor Milner, A.S.C., who is photographing the star in "Love Me Tonight." At his left are Cameramen Reshard and Johnson of the Paramount News Reel staff. All cameramen like Chevalier and Chevalier likes all cameramen, so it was only natural that this picture should happen when the News Reel men came in to talk over old times with Milner, who was once a news reel man.

Photo by Bert Longworth.

Tinted Stock

(Continued from Page 11)

	Exciting Influence	Tranquilizing Influence	Subduing Influence
Crimson	41	0	10
Scarlet	56	0	0
Deep orange	59	0	0
Orange-yellow	55	6	0
Yellow	53	6	0
Yellow-green	14	39	5
Green	28	32	0
Blue-green	32	23	6
Blue	11	21	30
Violet-blue	0	17	45
Violet	0	6	54
Purple	3	1	48

Further pertinent remarks on both the technical and esthetic aspects of color for motion pictures were made by Dr. Loyd Jones, A.S.C. in the AMERICAN CINEMATOGRAPHER, (July and August, 1929, issues) in an article on "Tinted Film for Motion Picture Positives" and its sequel, "The Emotional Appeal of Color."

Tinted positive stock is commercially available today. It costs no more than ordinary, untinted stock. It does not detract from the quality of the sound, yet it adds immeasurably to the emotional quality of the picture, for it enables the cinematographer to put the finishing touch on his attempts to visually match the mood of each scene. The various manufacturers of film have gone to a great deal of trouble and expense to develop a range of tinted stocks suitable for use with sound pictures: one manufacturer offers us eleven tints, another four. Between them, we are sure to find the answer to many of our problems in perfecting the visual and emotional appeal of our pictures. And—the perfection of these factors must inevitably react favorably at the box-office. Therefore, in these days when anything and everything to improve the box-office value of the industry's product must be done, can we ignore such a powerful aid as tinted-base stock—especially since it costs no more, and improves our work, the directors, and the players' so powerfully? Dare we ignore it?

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Volume 2

CINEMATOGRAPHIC ANNUAL

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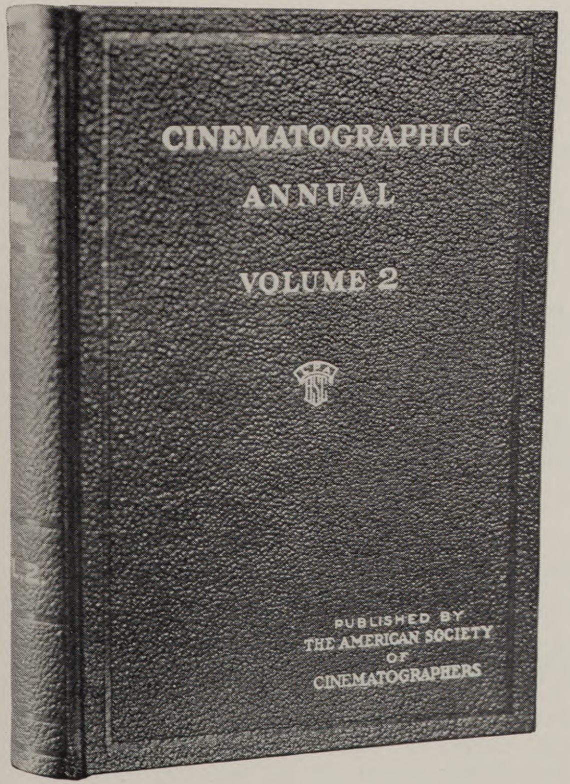

64 Page Pictorial Section

Just A Partial List of Contents

- The Cinematographer's Place in the Motion Picture Industry, Lighting, Cinematic Teleology, Making a Fadeout by After Treatment, Chromatic Correction in Cinematographic Lenses, Transmission Losses in Motion Picture Lenses and Their Significance, Making Matte Shots, Projection Arcs, Aerial Cinematography, The Motion Picture Industry and the School, Improvements in Motion Picture Film, The Relative Masses of Photo-Silver, Cinemicrography with the 16 mm. Camera, What They Use in Hollywood, Straight Line and Toe Records With The Light Valve, Process Photography, On the Theory of Tone Reproduction, with a Graphic Method For the Solution of Problems, A Method For Testing a Photographic Lens, Characteristics of Du Pont Panchromatic Negative Film, The Larger Screen, Motion Pictures in Natural Color, Graininess of Photographic Deposits—A Review, Acoustic Power Levels In Sound Picture Reproduction, A Parallel of Technical Values Between 35 and 16 Millimeter Films. The Use of Carbon Arc Lighting, Optical Printing, Costumes and Sets As Mediums of Expression, Eastman Supersensitive Panchromatic Type Two Motion Picture Film, Making Tests With a Small Camera.

Published in Hollywood by the

American Society of Cinematographers

(Camera Masters of the World)

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Laboratory Department

Conducted by **EMERY HUSE, A. S. C.**

Principles of Sensitometry and Their Practical Application

Part 14

IN considering the general subject of development it must be remembered that the silver grains which form the developed image are held in a layer of gelatin. This gelatin is used in making the emulsion which is coated on the support to make the sensitive film. The chemical process of development consists of the removal of the bromine from the silver bromide in the emulsion so as to leave the grains of silver behind.

There are many chemicals which will remove bromine from silver bromide but in order to act as a developer it is necessary to choose chemicals which have the power of converting the exposed silver bromide to metallic silver. These chemicals must not act upon the unexposed silver bromide because if such action should take place on the unexposed area it would be impossible to distinguish between that section of the emulsion which was exposed and that which was unexposed. There are only a very limited number of chemicals having this power of distinguishing between the exposed and the unexposed grains of silver bromide and as a result there are only a few substances which are suitable to use as developer. It should be borne in mind also that the chemical agent used as the reducing agent cannot work efficiently alone so that we must build for the proper development of an emulsion a formula which consists of the developing agent, or agents, and several other assisting chemicals.

In sensitometric parlance we usually think of a formula as consisting of four elements, designated by the letters R, A, S and B.

"R" stands for the reducing agent, such as pyro, elon and hydroquinone etc. "A" stands for the alkali which speeds up the action of the developing agent. Such chemicals as sodium carbonate and borax fulfill this capacity. "S" stands for sulphite, which is a preservative and prevents oxidation of the solution. Sodium sulphite is usually the chemical used for this purpose. "B" stands specifically for potassium bromide, which is the common restraining agent and this chemical plays a large part in preventing the development of the unexposed silver grains. In other words, it, among other things, retards the growth of fog.

Practically all developers, except physical developers, fulfill the requirements of the R.A.S.B. formula. This applies to formulas used for the development of negative or positive materials.

Following the above generalized statements it would be well at this point to deal a little more specifically with each of the types of chemical agents. We shall consider first the developing agents themselves.

Pyrogallol (pyrogallic acid) is made from gallic acid which is obtained from gall nuts imported from China. These nuts are fermented to obtain the gallic acid and the acid is then heated in a still from which the pyrogallol is distilled over. Pyrogallol is made in both the crystal and powder form.

Hydroquinone is made from benzine, which is first converted into aniline and then oxidized. Although it is somewhat less powerful as a reducing agent than pyro, it has less propensity to give stain. Hydroquinone is used most often in conjunction with elon and, as a matter of fact, practically all motion picture developers contain hydroquinone and elon. Hydroquinone keeps very well when used in tank developers because it does not oxidize readily.

Elon is a trade name for the organic chemical monomethyl para-aminophenol sulphate. Elon is chemically related to aniline, which is used as the base of coal tar.

There are numerous other developing agents but those above mentioned are by far the most common and in present day practice, particularly in the motion picture field, hydroquinone and elon are used almost exclusively as the developing agents.

The other chemicals used in conjunction with the developing agents will be briefly listed and explained here. Sodium carbonate is made by the treatment of salt solution with ammonia and carbonate dioxide which reacts with the salt to produce sodium bicarbonate. The sodium bicarbonate is then heated and half of the carbonic acid is driven off, producing what is known as "soda ash." This is then dissolved in water and crystals containing ten parts of water are produced. From this a crystalline salt with either one or ten parts of water is prepared for photographic use but owing to the uncertainty of the composition of these crystals, pure dry sodium carbonate is usually prepared. This is obtained by heating the pure bicarbonate, which can be precipitated from a solution of the crystals by means of carbon dioxide gas.

Borax, or sodium tetraborate, is prepared from certain calcium ores by first roasting, then boiling in sodium carbonate and bicarbonate solution and finally crystallizing in large iron vats. It is interesting to note that virtually pure sodium borate is obtained from Kern County, California, and requires only dissolving, filtering, and re-crystallizing to prepare it for the market.

Sodium sulphite is prepared by blowing sulphur dioxide gas into a solution of sodium carbonate. When sulphite is crystallized from the cooled solution it forms crystals containing seven parts of water to one of sulphite, which contains, when pure, fifty percent of dry sulphite. These crystals give up water when kept in the air and form a white powder on the surface. The dessicated salt may be prepared in a pure state almost free from sulphate. Sulphate is formed by oxidation when sulphite is exposed to the air. The dessicated sulphite when prepared as a dry powder will keep well for a long time.

Sodium bromide is prepared by the action of bromine on sodium hydroxide. This chemical can be obtained in a very pure state.

In our next article we shall begin our discussion on the development of the photographic image and consider somewhat the structure of that image. It is proposed also to present formulas which are useful in the development of motion picture films, both negative and positive, in tanks and in machines.

◆

3,500 Installations Made by Photophone

MORE than 3,500 installations of sound reproducing equipment have been made so far by the Photophone division of RCA Victor Co., said E. O. Heyl, manager of the division, at the RKO sales convention last month. The company also has equipped 30 licensees of recording apparatus in Hollywood and studios abroad, he declared. Replacements, universal adoption of A-C current and widespread interest in the new 16 mm. sound-on-film portable apparatus have been keeping Photophone at capacity production, Heyl added.

Now they're "shooting" it *on location,* too

FOR some time after its announcement, Eastman Super-sensitive Panchromatic Film was used chiefly under artificial light. Now many cameramen are "shooting" it on location, too...for these reasons: (1) Its speed substantially lengthens the photographic day ... (2) It offers special advantages in photographing certain types of scenes and costumes... (3) In *all* scenes it yields that subtly superior quality which marks the most advanced motion picture photography... (4) It gives the cinematographer a single negative medium for all purposes...a medium which, once fully understood, affords a range of possibilities bounded only by the user's imagination and technical skill. Eastman Kodak Company. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

EASTMAN *SUPER-SENSITIVE*

Panchromatic Negative (*Gray-backed*)

Sound Recording—Art or Trade

(Continued from Page 17)

With the sound man, it is different. He places his microphone, and adjusts his circuits to get a good, commercial record—and lets it go at that.

And yet—just as much creative artistry is possible in sound recording as in cinematography. But the creative will must be behind the apparatus; creative ingenuity must be exercised to manipulate and modify the apparatus to produce these new effects. And, thus far, this impulse is lacking.

Of course, our present-day sound equipment is to a certain extent inflexible. But—so was the motion picture camera at the start. Originally, the motion picture camera was an imperturbable, unimpressionable box, which, when fed with film and properly cranked, produced an accurate, commercial record of whatever action took place in front of its lens. It was set in position for a scene (very accurately, this, for the lenses were fixed focus affairs), and the scene was made—a wiry-sharp long-shot. But the cinematographers were not satisfied; they began to experiment. They moved their cameras about, and produced close-ups and medium-shots. They set them on wheels, and produced trucking-shots. They placed them at unusual positions, and discovered the power of angle-shots. They modified them with filters and diffusers, and learned how far more artistic a modified record may be. They sped up or slowed down their unalterable 16-pictures-per-second cranking speed, and discovered the possibilities of speed-changes, slow-motion, and stop-motion. They bent the unlying camera to their wills, to heighten the dramatic values of the stories.

The same is true of sound equipment. Today, it is an inflexible, commercial recording instrument. Tomorrow, it may easily become as facile an artistic tool as is the camera. But, like the cinematographer, the recordist must develop an artistic sense. He must learn how to modify his record, and when to modify it. The means is, to some extent, already at hand. The acoustic qualities of sets can be distorted for effect, as has occasionally been done already. Special circuits exist, and more can be developed, to distort or enhance voices. Much can be done with even so simple a thing as microphone placement, to establish dramatic values through sound perspective. The re-recording, pre-recording and post-recording processes—to say nothing of dubbing—can yield a vast deal of dramatic modification. But perhaps the greatest possibilities lie in the realm of pure sonic artistry. Certain foreign pictures—like Rene Clair's—and a few American ones—like Lubitsch's and Frank Tuttle's "This Is The Night"—have pointed the way to a new utilization of sound: not as strictly commercial dialogue, nor yet as synchronized accompaniment or sound-effects, but as an altogether new device in which the sound, with its characteristics of aural rhythm plays a part akin to the visual rhythm and flow of motion that so distinguished the best silent films.

But to accomplish this, the recordist must awaken to an appreciation not alone of the potentialities of sound artistry, but of his individual potentialities as an artist and technician. He must prove himself as an artist, and he must be granted the personal recognition accorded artists in other departments. These done, the future rests entirely in his own hands.

Sound recording today is technically perfect, or very nearly so. Therefore, let us forget that we are recording engineers, and see if we cannot, like the cinematographers, become artistic engineers, instead. For now that sound is no longer a mystery, the day of the recording engineer is declining, while the day of the recording artist is just dawning.

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The Artreeves Color Corrected Optical Unit and Wedgelite Recording Lamp

IT IS generally understood by the Motion Picture Technician that the term "Achromatic" as applied to motion picture Cinematography means that the lenses comprising the photographic objectives are color corrected or compensated to transmit all of the color spectrum without undue loss in any one color or over transmission of another. It is not commonly known however that this same Achromatism may be applied to that which is known as a "Slit," or sound recording aperture.

Color, as per the Photo-Electric Spectrum, has a range in Angstrom Units of from approximately 9000 in the Infra-Red, to 2000 in the Ultra-Violet. The limit of human vision in the Spectrum is from 8000, Infra-Red to 4000, Ultra-Violet. The sensitivity of Orthochromatic Film from 6000, Orange-Yellow to 3200, Ultra-Violet. Panchromatic Film has a range of from 7000, Infra-Red to 3200, Ultra-Violet.

The Audible Spectrum, in cycles per second, ranges from 16 to 16000. The limits of Human Ear sensitivity covering the entire range from 16 to 16000. The Human Voice ranges from 40 to 1,152.

The Artreeves Color Corrected Optical Unit is color corrected for a range of from 7000, (Panchromatic Sensitivity), to 3200, or from Infra-Red to Ultra Violet. And in the Audible Spectrum, this optical unit has a practical recording range of from 16 to 16000 cycles per second. Tests have been made in frequencies up to 25000 cycles or 9000 cycles beyond the highest range of the Audible Spectrum.

To obtain satisfactory results when recording in the higher frequencies, one must also take into consideration the stability of the light source and its ability to stand up under these extreme variations of light without breaking down or falling off. The wedge shaped Cathode as built into the Wedgelite has proven to be the ideal construction for Recording Glow Lamps due to its extreme durability and lack of shadow or "Ghost."

The reader will agree that the light source, or Recording Lamp, used in combination with an Optical Unit must of necessity be so engineered that both light source and Optical Unit are optically matched. To do this, both elements must be built up together and then so corrected as to allow the maximum transmission of light without loss of Actinic values due to the light emitted by the light source being diverted from its intended position in relation to the film stock. Or again, loss of definition or density caused by the inability of the Optical Unit to transmit all of the frequencies or component colors. The Copyright owner of these two elements, the color corrected Optical Unit and the Wedgelite is the Hollywood Motion Picture Equipment Co. Ltd., who are also the sole distributors.

◆

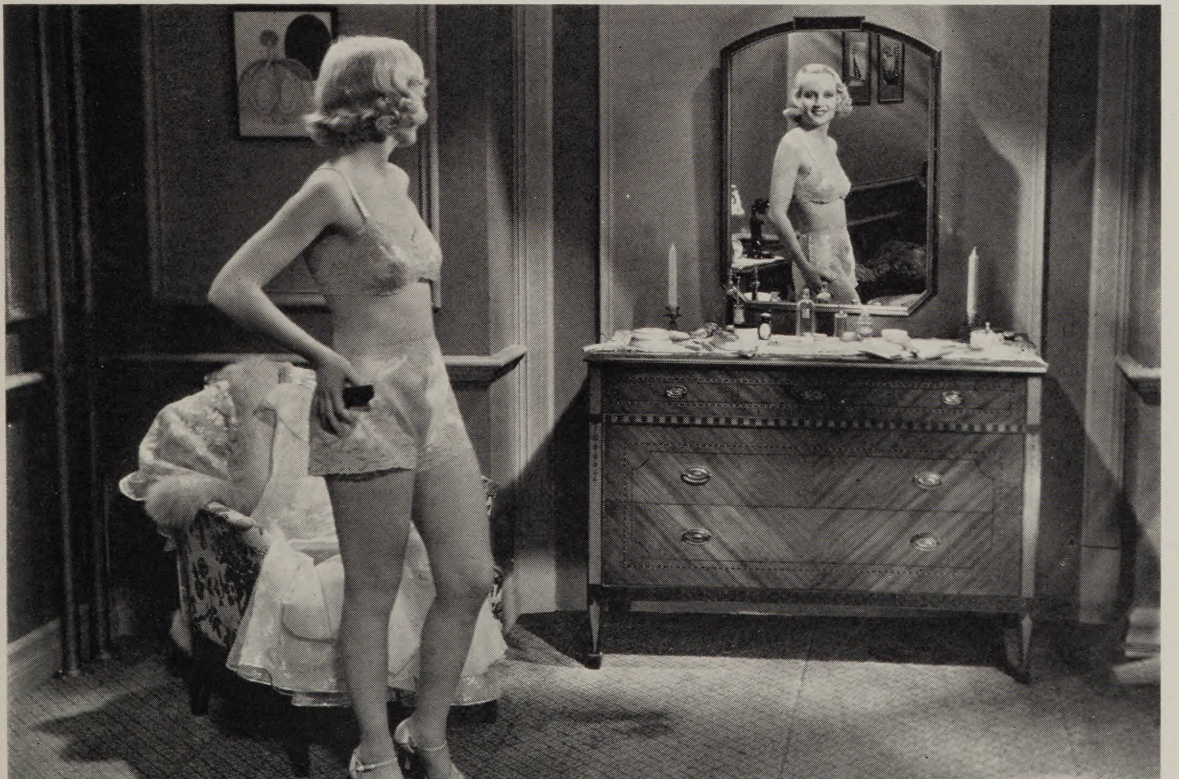
New Exposure Meter

SPINDLER & Sauppe, Inc., of Los Angeles and San Francisco, have just introduced a new exposure meter on the market which is attracting much attention among cameramen in the various Hollywood studios.

This new meter, which appears to be as near fool-proof as any piece of equipment can be, has no batteries. It uses a Weston Cell and a special electrical circuit which makes the instrument extremely sensitive and allows very accurate readings over a range from f 1.4 to f 64. The operation of the meter is simple. You point it toward the object to be photographed and instantaneously the hand on the meter points to the diaphragm opening to be used on the camera lens.

STYLES *from* HOLLYWOOD

◆ Beginning with this issue a page of styles from Hollywood will appear each month in the AMERICAN CINEMATOGRAPHER. This month we give our readers a glimpse of what is what in lingerie in the pictures. At left we see Anna May Wong in a charming pair of red brocaded pajamas for her role in "Shanghai Express," in which Marlene Dietrich was starred. At right and below are two studies showing the very latest in the intimate articles of clothing as worn by the stars. Next month evening wraps will be featured on this page.



Amateur Movie Making

by WILLIAM STULL, A.S.C.

TIME—as more classic writers than myself have often remarked—has a disconcerting habit of stealing up on us. In other words, both the calendar and the weather-bureau agree that it is nearly summer again—and accordingly once more the open season for amateur cinematics. It is hard to realize, in this land of all-year-round filming, that in some sections many amateurs carefully lay aside their cameras, along with their tennis-rackets and bathing-suits, during the winter months. But, for the benefit of the owners of such hibernating cameras, let me drop a hint: why not have your camera checked over now—and be sure that it is in perfect shape for your summer's shooting? If the manufacturer does not have a branch or service-depot near you, your dealer will certainly either have one, or be able to direct you to a competent repair-man. With everything from the Olympic Games and the presidential campaign to the return of prosperity slated for this summer, it's a good idea to be ready to shoot, without fear of breakdowns or buckles.

Direction

According to many letters that have reached this office of late, a majority of the pictures destined for the AMERICAN CINEMATOGRAPHER'S great amateur film contest are soon to go into production. Their makers, I am sure, are interested in the subject of direction. The rest of the amateur camerists seem to be in some way or other interested in it, too. That makes it unanimous—so let's talk it over.

In the first place, contrary to many folks' preconceived notions, direction is not solely the problem of the maker of the dramatic film. No film subject—not even the newsreel—can be a satisfactory picture without some measure of direction. The people who actually do it may call it by some other name—but the result is the same, nevertheless.

Reduced to its simplest terms, direction is nothing more terrifying than the application of common-sense to cinematography—knowing what is wanted, and getting it in the most effective way. One simply cannot think of direction without thinking of cinematography, for the two are inextricably inter-related. If you say that direction means having people move this way or that, or using a close-up here instead of a long-shot, you are quite right: but if you follow the question farther, you will come right back to cinematography, for the answer will inevitably be, "He did so-and-so because it photographs better." In the studios, this is an established fact. Moreover, there are dozens of instances daily of cameramen actually directing the pictures they photograph—simply because they know the basic laws of photographic story-telling, and the director does not. Last week, I had lunch with a well-known director and his cameraman. During the meal, the director remarked, "I don't know what I'd do without — — on this picture. Every time I get into a tight spot over some scene, he pulls me out, for he knows exactly what to do. I'd be lost without him." Yesterday one of my friends showed me a telegram a prominent director had sent him after the preview of his (the cameraman's) latest film: "Congratulations on — —'s latest picture. You did a splendid job of direction." The amateur has in this respect, the advantage over the professional, for he is in a position to both direct and photograph his picture—and to receive screen credit for both jobs!

Camera-Angles

One of the first points to be learned in directing—and one of the most photographic—is the use of camera-angles. This includes everything from the distinction between close-up and long-shot to such intricate questions as Director Rouben Mamoulian recently discussed in an earlier issue of this journal. No unalterable law can, of course, be laid down to cover this question; but the answer to any problem in camera-angles can invariably be found in the answers to the questions "What do I want to show?" and, "How can I best show it?"

As a general rule (even in scenic or documentary films) the best plan to follow is to begin each sequence with a long-shot, to thoroughly establish the geography of the scene or set. Then, work progressively closer to the specific part of the scene, or the particular actor or actors upon whom the interest centers. Remember that, except in travel films, where the interest of course centers on the background, the actors in the scene are the important things: the closer one can get to them, the better one can understand what they are doing. One of the greatest faults of most amateur films is the scarcity of closeups. Therefore, don't be afraid to use a little extra film on them. And—when making close-ups, make your scene first as a long-shot, and then go back, and repeat the action in individual close-ups; this makes for easier cutting. As professional producers have found out, it's easier to use a little more film when you are actually doing the shooting than it is to retake missing scenes later, or stretch scenes out to cover gaps in continuity or action.

Continuity of Motion

In the making of any motion picture—even the simplest—we can rarely photograph all of the scenes in their exact order; but they must be made so that, when cut, they will appear as though they had been so photographed. They must, of course, match photographically—be of the same density and gradation, with the same types of filtering and effects. But they must also be the same with regard to direction of movement. The most obvious point for a director to remember is to preserve the proper continuity of movement: in other words, the direction of an actor's movement should remain the same, unless the reason for its reversal is shown on the screen.

Let's take a concrete example. Suppose that Father has sworn off smoking: but he finally weakens, and decides to slip down to the corner drug-store for a cigar. If, in our first scene, we have him come from the door of the house at the left, cross the scene, and go out to the right, we must keep him going left to right until we show him reaching the store and starting his return. If he were shown in one scene walking from left to right, and in the next, walking from right to left without any explanation, the audience would sense something wrong: the change of movement would confuse them. If, on the other hand, he is shown meeting a neighbor who tells him something that represents a definite change of motivation, he may conceivably be shown travelling in the opposite direction—providing that this new direction is maintained to the end of the sequence. Remember, the audience can only judge directions and motives from what it actually sees on the screen, and to keep the thought of motion connected in their minds, it must be continuously in the same direction, regardless of what it would actually be in real life.

If we want to show two separate movements—and keep them separate—we can best do so by keeping them moving in opposite directions on the screen. Of course, if they are definitely established as being on the same path, in the same dramatic direction, they must be so shown on the screen. To

(Continued on Page 40)

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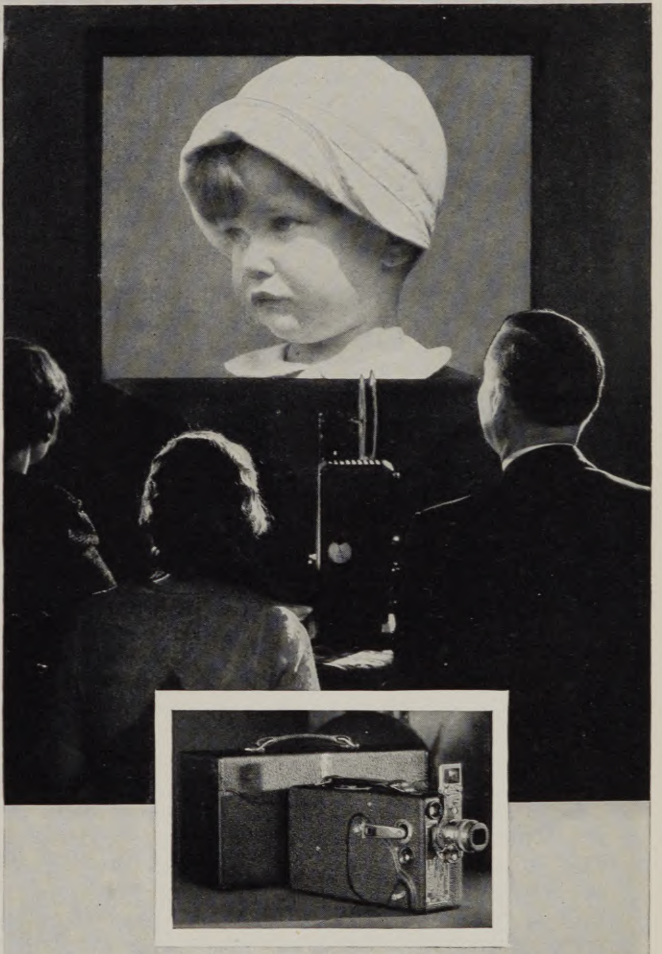

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Helpful Hints for Amateurs

by **HAL HALL**

SCARCELY a day passes that does not bring at least one letter to this writer's desk asking for technical information and advice regarding amateur cinematic problems. These inquiries are always answered by mail, but it seems to this writer that some of these problems might be of interest to many of our readers. This article will deal, therefore, with some of these questions in the hope that many of our readers will gain some useful information that may be of service to them in their own 16 millimeter work.

An interesting question was asked recently. It was this: "I want to photograph a scene so it will look as though the action was taking place behind a spider's web. How can I do this?"

There's one for the ambitious amateur to try. Well, here is how to do it. Take two wooden blocks, small enough to be handled conveniently, and place a bit of ordinary LePage's glue between them. Rub the blocks together for a moment, then pull them apart—and you have your spider's web, or at least part of it, ready to be placed wherever you desire. Put it in front of your lens and photograph, and you will have your effect.

Another reader asked: "How can I arrange my projector so that the picture is thrown at right angles to its normal path? I have not sufficient space to use it normally."

This is how to do it.—A small mirror fixed in front of the lens might do, though with ordinary mirrors you would probably have trouble with reflections from both surfaces of the mirror. An optical mirror, such as the Bausch & Lomb Company uses on some of its "still" projectors, would be better and would have a satisfactory long life if properly cared for. However, the best arrangement would be an optical prism mounted on the lens. This, however, would have to be large enough to accommodate the enlarging beam of light as well as the one entering from the lens. It is possible that the device the Bell & Howell Company markets as a "Prismatic Eye" for their cameras might do the trick.

Another amateur asks what is the best diffuser to use: gauze, disc or soft-focus lens. I would say that the disc is best, for it maintains the same brilliancy, contrast and quality throughout the picture. The gauze reduces the exposure and varies the contrast; graying the shadows, reducing the brilliance of the high-lights, distorting the brighter points of light into innumerable little crosses of halation conforming to the mesh of the gauze. The soft-focus lens is pleasing, but limited to the one type of work.

The matter of backlighting a woman's hair with a reflector is brought up by another amateur who wants to know what type of reflector is best suited for such a problem. The type of reflector depends upon the hair. For example, an ordinary mirror is the best reflector to use in cases where the subject has brilliant, fiery red hair; also for a golden blonde. But a softer reflector should be used for a distinct brunette. I would suggest, as a home made affair, that you use a reflector painted with a dull white or a dull silver paint. For a chestnut brown head of hair or an ordinary blonde, use a reflector with a glossy finish, or one covered with tin foil.

While on the subject of reflectors, let me add that wise use of reflectors will be a distinct aid in securing better exterior pictures. Reflectors are easily made. Just use a square of light wood, or beaver board, size according to what you want—I would suggest three feet high by two and one-half feet wide. For a soft reflector paint it with dull white or dull silver. For a hard reflector paint with glossy white enamel or cover with tin foil. These are a remarkable aid to good exterior photography. One of the most comprehensive articles on the use of these reflectors is found in the March issue of the AMERICAN CINEMATOGRAPHER, 1932. It was written by Charles Clarke, one of Hollywood's best known cameramen.

One amateur wants to know how to get the effect of reversed action with his camera which has no reverse mechanism. All that is necessary to get the reversed effect is to turn your camera upside-down and shoot your scene that way. When the film comes back from the laboratory cut out the scene and resplice it in with the rest so that it is "heads-up" with the other scenes and on the screen the action will be reversed.

"I want to try some of the back-lighting effects I see in professional films, but the instruction book says never to make a picture except where the light comes over your shoulder. Is there any special device the studio cameramen use to get such effects?" asks another amateur.

You can get the effects you speak of with any amateur camera if you use a lens-hood or sunshade on your camera, and if care is taken that the direct rays of the sun do not strike the actual lens surface. In back-lit shots the light should come from behind and slightly to the side of the subject, and if exterior, the best results are obtained when the sun is fairly high in the sky. Of course you should use a reflector to illuminate the shadowed side so the detail will not be lost there.

An amateur from Boston asks—"To what extent does the elevation of a camera affect the horizon distance?"

Obviously, a man on level ground can only see a few miles, but at 3000 feet one can survey a 58-mile circuit, and at 6000 feet one of more than 165 miles. The Army's figures for relative visibility are: 10 feet, visibility 6,800 yards; 100 feet, visibility 21,500 yards; 300 feet, 37,300 yards; 500 feet, visibility varies between 48,200 yards and 52,100 yards. If the object viewed is 25 feet high these figures are increased to respectively 17,500 yards, 32,200 yards, 48,000 yards, 59,900 yards, and a maximum (due to refraction) of possibly 63,700 yards, or more than 30 miles.

And now comes another gentleman who wants to know how to determine whether a lens is negative or positive.

Perhaps the simplest test is to hold the lens at arm's length and rotate it in a plane at right angles to the line of view. If the image seen through it seems to go OPPOSITE to the hand's motion the lens is convex, or positive. If it does not move, there is no lens action. If the image goes WITH the motion, the lens is negative. Also, the negative lens will not throw an image on a screen as a positive lens does.

An amateur from Seattle asks us if it is necessary to correct exposure for increased altitude. Yes, this correction should be made for the best results. A good rule to follow is to give normal exposures below the 4000-foot level; from there to around 5000 feet three-fourths normal; and from 5000 feet to well over 6000 feet half normal. Exposures must be further reduced if snow or large bodies of water figure in the picture to any great extent; and still more if immediately after a rainstorm or snow-storm when the air is usually free from dust particles. We recommend Panchromatic film and filters for all high altitude cinematography, and as the light conditions are more than usually deceptive, an exposure meter really should be used for accuracy. Incidentally, an exposure meter is a valuable instrument for any amateur.

Shadows

by **GEORGE W. HESSE**

IN PHYSICS we have a law which states that "Every action must have an equal and opposite reaction." We might profitably study this law and modify it somewhat to broadly fit the subject of cinematography and more specifically, of lighting. Applying it to this complex problem we would say "Where there is light there must be shadow."

Some such law might very well be the cornerstone upon which all lighting is built. Without shadow we could not get very far in producing pictures with any pictorial or realistic pretensions.

Look about you and notice what an integral part shadow plays in identifying any object. Without shadows things appear flat and all on one plane. In a shadowless world we would not be able to judge distances accurately. Nor would we be able to judge form. Take a sphere for example. We differentiate between a sphere and a flat circular object of the same size by the fact that the sphere has a certain amount of shadow under it and also by the fact that the intensity of illumination on the sphere falls off and becomes progressively more shaded as it approaches the horizon while the flat object, being on one plane, is of one even intensity of illumination.

Shadows are strange intangible things. You can see them and produce them but you can't feel them. They are as real as the objects casting them yet they have no substance. You can never disassociate a shadow from the object casting it. Which is rather fortunate, for the shadow plays a vital part in the representation of an object.

Take any object, say a chair, a book, a vase or anything and flood it with light of an equal intensity from every angle so as to wipe out all shadow. What a flat, lifeless thing it is to look upon. It does not seem to be resting on anything . . . why it almost appears to float in space.

True every detail stands out as clearly as every other detail. No one detail is any less prominent than its neighbor. Such a lighting would be admirable for record purposes perhaps but would have absolutely no application to pictorial usage.

It should be understood that by shadow is meant not only the shade which one object casts upon another but also the shading of the various planes of the object itself . . . as in our example of the sphere. It is the treatment of light and shade in a picture that the artist, a fussy fellow, calls chiaroscuro, a word which I prefer doing without.

Let us first consider light as it occurs in nature. The natural source of light is, of course, the sun. Its rays strike an object after passing through various diffusing mediums such as the atmosphere, clouds, haze, etc. Other rays are reflected back to the object from the ground, clouds, sky and other objects. It is these rays which illume the shadows which would otherwise be black. However, reflected light is never so strong as to equal direct light.

The balance between the direct and the reflected light continually varies in nature as the time of day, season and atmospheric conditions vary. On a bright day the balance between the highlight portion of an object, that part illuminated by direct light, and the shadow portion, (the portion illuminated by reflected light) is extreme and we say the range of contrasts is great. At such a time we are hard put to secure a faithful rendering of an object, especially if it be rather small, as would the head if we were making a portrait. On a cloudy day the range of contrasts is slight for then the majority of the illumination is by reflected light and the balance between the highlight and the shadow side is nearly even.

A useful instrument to determine the range of contrasts is the monotone filter. This is a purely visual filter and cannot be used photographically. By holding it to the eye and looking through it you can determine just about how the scene will photograph, where the shadows will fall and about the range of contrasts between the highlight and the shadow portions. It will show, in monotone, how the various colors will photograph. For this purpose there are two types, one for use with panchromatic emulsions and the other for use with orthochromatic emulsions.

Since our natural source of light is above us we have accustomed ourselves to that condition. Shadows falling other than below an object would be, to our eyes, unnatural.

Thus when we must light a scene by artificial light we attempt to mimic nature as closely as possible and our main light sources are placed quite high. For this reason, in portrait work, the basic and most natural looking light source is that which strikes the head at an angle of 45 degrees.

The importance of shadows cannot be underestimated. In portrait work they have long been given their proper importance and the way they are handled determines whether one is producing a character study of the sitter or just another photograph.

When photographing women they should be done so beautifully. The lighting should be in a high key and aim to express femininity. The tonal range between the highlight and the shadow should never be very great.

The lighting for men on the other hand should express rugged virility. The tonal contrast should be much longer than that employed for women. In fact it should be more or less contrasty without being violent.

The problem of securing depth in our pictures has long been a perplexing one. The proper study of shadows will lead to a partial solution in securing the so desirable pseudo-stereoscopic quality aimed at. Is of course cannot produce true depth but merely an illusion of depth.

We can secure the necessary illusion by contrasting the planes of the scene. For example a brightly lit foreground, against a shadowy middleground which in turn is contrasted against a brightly lit background will create an illusion of depth.

Shadows of objects in the scene such as chairs, tables, lamps and the like will also aid in maintaining this illusion. The shadows of course help separate the objects from their surroundings and aid us in realizing that the objects are not all on one plane.

Permitting shadows to go wild is responsible for more dull and unimaginative photography than any other one factor. It seems rather foolish inasmuch as we have such excellent means of controlling shadows by those handy little accessories, reflectors.

In outdoor work especially can we find scores of uses for reflectors. A pretty little wooded dell or a ravine which seemed so interesting to our eye when seen on the screen looks dull and flat.

What happened to it . . . why didn't the screen image impress us the same way that the actual scene itself did? When we actually saw it we did so in its natural colors and we saw color contrast which livened up what was really nothing but shadow with very little tonal contrast. We did not secure the same color contrast on the screen, hence the result fell flat.

(Continued on Page 50)

Optics of Projectors for 16 mm. Film

by **A. A. COOK**
Bausch & Lomb Optical Co.

THE fundamental requirements of apparatus designed to project motion pictures from 16 mm. film are too well known to need any detailed description. The apparatus must be compact and light, and the number of adjustments necessary to operate it should be reduced to a minimum. As an optical instrument it ought to produce a clearly defined image on the screen. It is also obvious that the location of the optical elements and their relation to the light source must be exactly maintained if maximum illumination is to be consistently secured.

Projection optical systems consist of a source of light, a collective system for directing the light through the film gate, and an objective lens for imaging the film upon the screen. Let us first consider the light source. The advantages of tungsten lamps are evident from the requirements already outlined. They are small in size, easily located in a fixed position, and require a minimum of adjustment during operation. Several filament designs of high efficiency have been developed with parallel coils arranged to fill a rectangular space about two-thirds the size of the film gate opening. The spaces between the coils are of approximately the same width as the coil, this arrangement permitting the use of a spherical mirror behind the lamp to image each coil in the adjacent space. This adds to the efficiency by heating the filament and gives the unit nearly the appearance of a solid source. By doubling the useful angle of radiation in this way an increase in illumination of 50 to 75 per cent is obtained. The exact amount depends on the quality of the mirror and the position of the filament supporting wires.

The filament housing is a tubular bulb 1 ¼ inches in diameter. This size has been adopted as standard for 16 mm. equipment, although it may not prove sufficient for the continual demands for higher wattage.[1] Bulb diameter is an important dimension from the optical point of view. The efficiency of the condenser and reflector depend on the angular size of the cone of light that they can take in from the source and transmit through the system. A shorter distance between filament and condenser would be helpful, therefore, in that it would permit a larger angle to be used by a condenser of given diameter. Lamp manufacturers have been working on this problem, as is shown by the fact that in some of their recent designs the filament has been offset to a position well forward of the center of the bulb. This change provides a mechanical advantage which can be especially useful in the 16 mm. projector. Condenser design has often been handicapped here by the limited space available. An increase in the diameter of the mirror will be necessary, of course, for its distance from the filament has been increased. There is more room behind the lamp, however, and this slight change can be easily made.

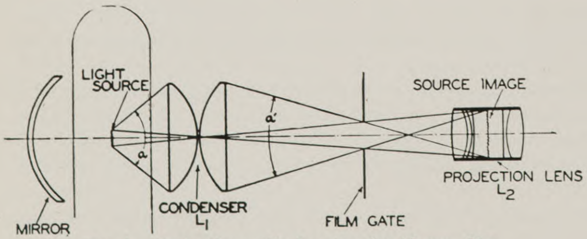

FIG. 1. Projection optical system for 16 mm. film.

The collective system may be either a condenser or a reflector. Both methods have been applied to the illumination problem in projection, but more space is required by a reflector, for the same useful angle of radiation, than by a condenser with rear mirror. Therefore, the condenser has been the preferred form in 16 mm. machines.

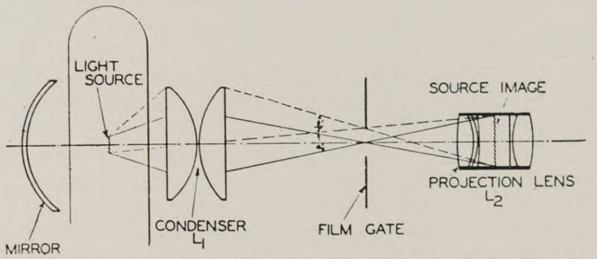

FIG. 1a. 16 Mm. optical system, showing illumination at margin of film.

The function of the condenser is a subject that has been thoroughly analyzed and presented before this Society.[2] Only an outline will be given here of the working of this element of the optical system as it applies in this special case. If a solid source of light of sufficient size and uniform distribution could be placed at the film gate, no condenser would be needed. A tungsten filament is not solid, however, nor can a lamp bulb be placed at that point. By using a condenser a source image is substituted for the source itself; by locating the image in front of the film plane the unevenness of the source can be equalized. Fig. 1 is a sketch showing the condenser in its relation to the other parts of the system. The condenser, L_1, produces a magnified image of the filament of such size as to fill the projection lens, L_2. In doing this it takes in the large angle of radiation marked a, and forms the image at a smaller angle a'. The radiation can now be transmitted through the projection lens L_2, as a result of this change in its direction. In this way the condenser makes useful the radiation from a small source through a large solid angle in space. Otherwise, a very large source would be needed to produce the same effect.

There is a very definite relation here between the size of the source, the size of the projection lens, and the focal length of the condenser. All the parts of the optical system are interdependent in this way, and proper proportions must be maintained to obtain maximum efficiency of the whole unit. The conditions determining the diameter of the condensing lenses are shown in Fig. 1a. Two solid lines drawn from the extreme edge of the effective lens opening to the center of the film aperture form an angle a'. The broken lines in the same way determine angle b' at the margin of the picture. These two solid angles, a' and b', must be equal in size and must be filled with light in order to get the best possible illumination at the corners of the screen. This means that the condenser should be large enough to furnish light through all of the angle b'. This condition is usually not perfectly fulfilled in practice. A 15 per cent decrease of illumination at the margin is commonly accepted as satisfactory.

Condensers constructed according to these specifications are still found to differ considerably in efficiency, due to differences in their correction for spherical aberration. This is a well-known defect, found in all simple lenses, that causes in this instance a loss from the marginal portion of the light beam as it is converged to the image point by the condenser. The loss is not so serious in 16 mm. projection systems as in cases where the source image is located at the film gate. It can be corrected to a large extent by proper condenser design. The use of aspheric surfaces is one effective method, this kind of correction having been found to result in screen illumination 15 per cent greater than that obtained with the ordinary plano-convex condenser lenses.

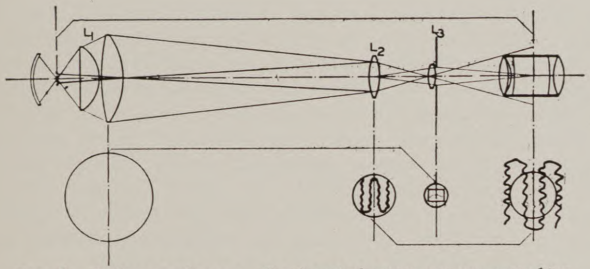

FIG. 2. Relay condenser. Conjugate images are connected by brackets.

The relay condenser is a more complex device that may prove useful with 16 mm. equipment. Its use in motion picture work is not new.[3] But it produces uniform illumination from a tungsten source with so little loss that it ought to be included in any discussion that deals with projection from filament lamps. As shown in Fig. 2, it is a compound lens system composed of three units. There is a condenser system, L_1, of large angular aperture to image the source upon a relay lens, L_2, placed a short distance in back of the film gate. The third element, L_3, serves to form a second image of the source in the projection lens. The relay lens must be large enough to receive all of the source image, and of such focal length as to form a reduced image of the condenser at the film gate. Note that it is the evenly illuminated condenser surface, not the source, that is imaged on the film. This accounts for the uniform screen illumination produced by the system. It is 40 per cent more efficient than plano-convex condensers. The extra length of the unit, amounting to six inches over all for a 16 mm. outfit, is a decided disadvantage. But if it ever becomes necessary to build a special type of projector for school or auditorium use, this method of illumination should be of great service. It can be constructed to work with a small source, and provide sufficient magnification to fill larger projection lenses than any that are now used in 16 mm. work.

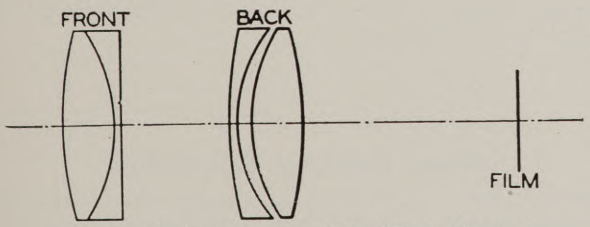

FIG. 3. Projection objective of Petzval type.

The projection objective is the third important part of the optical system. Two-inch focus lenses of f/2.0 are standard equipment at the present time on practically all projectors except those designed for use in cabinets. They must be well corrected for this large aperture, but the field to be covered is so small that the requirements can be met without difficulty. There are many types of lenses that could be used. In any such situation the cost element is bound to be a decisive factor, and it has operated in this case to select the least expensive lens that can be made to do the work. Before discussing the details of this particular lens construction, it would be well to consider the original from which it was derived. This lens form, shown in Fig. 3, is Petzval's portrait objective. It has undergone modification many times, but is still the formula most often used for projection work. It can be very precisely corrected for the small field required, and has a light transmission, in short focal lengths, of 73 per cent.

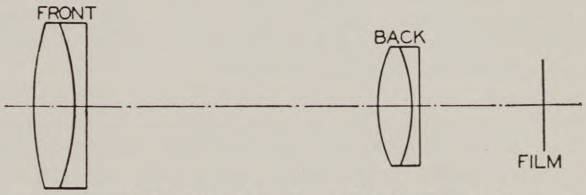

FIG. 4. Projection objective with short back focus.

Fig. 4 shows the modified form that is now used in so many 16 mm. projectors. Note that the two rear elements have been cemented, and that the spacing between front and back has been increased to nearly twice the length of the original construction. The first change, by eliminating two air-glass surfaces, increases the light transmission to 81 per cent; the increase in length has the effect of shortening the back-focus of the objective. This means that the rear element can be made smaller in diameter without sacrificing in light transmission, and that it has more space in which to converge the beam of light from the film gate. The rear element thus acts as a collective lens for the system, which results in the practical advantage that objectives of this construction, of any focal length, can be used interchangeably on a projector without alteration or adjustment of the condensing system. The only disadvantage of this short back-focus objective is that it has a slightly curved field. This defect is noticeable only in critical tests, however, and would be difficult to detect in practical use on a projector, with moving film as a test object.

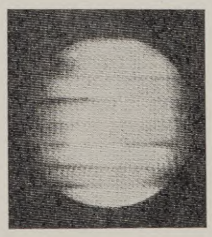

Fig. 5. The filament image as it appears in the projection lens.

The final screen illumination produced by a 16 mm. projection system depends on the effectiveness of the four elements that have been described: the light source, the rear mirror, the condenser system, and the projection objective. Increases can be obtained by using a brighter source, by improving the condenser correction, and by increasing the aperture ratio of the entire optical unit. Recent attempts at improvement in the 16 mm. field have been mainly directed toward the light source, and this choice is a logical one for the equipment manufacturer because it involves the least amount of redesign on his part. To meet this demand lamps of greater brightness have been developed, the increase being due to the use of larger wire size in the filaments operated at a lower voltage than previously used.[1] The possibilities here are beyond the field of optics, and must be left to the electrical engineer.

There are two points about lamp filaments, however, which are of optical interest. One is the fact that filament supporting wires cause illumination losses unless they are placed outside the angular field of both the condenser and the rear mirror. The second concerns the filament itself. The aperture of a projection system must be filled with light if it is to work at its best efficiency. With a filament lamp, the source acts as a discontinuous surface, and the openings in its area cause a real loss of light. This effect is shown in Fig. 5, which is a photograph of a 4-coil tungsten filament and its mirror image,

(Continued on Page 50)

Amateur Movie Making

(Continued from Page 34)

continue our example: if we want to show Uncle Bob going from his house to the same cigar-store, it is wisest to show him going from right to left, in contradistinction to Father's left-to-right progress. On the other hand, if Mother learns of Father's escapade, and decides to follow her errant spouse, she, too, should go from left to right.

In the same way, if an actor leaves a scene from one side, he should re-enter it from the same side; but if the scene is changed, he should enter the new scene from the opposite side from that at which he left the preceding one. He may have done anything or nothing at all between the two scenes—but as long as he was not shown doing them, he must obey these conventions of cinemotion. To hark back to our imaginary story: since Father left the house scene from the right, he must return to it from that side, and enter the drug-store scene from the left.

Tempo

I have discussed "tempo" with many directors, cinematographers and actors: they all agree that it is one of the most abused words in the cinematic vocabulary. In its proper application, it means the physical pace of an action or scene. Obviously, in our imaginary sequence it would be incongruous to show Father in one scene walking, in the next running, and again walking slowly in the third. So, Father must walk at a fairly steady pace throughout the whole sequence—unless some new dramatic element enters to change his pace. But suppose that on his way to the drug-store, he meets a friend who tells him that his office is on fire, then he will have a definite reason for running in all the succeeding scenes.

Changes of tempo can be used with good effect to bridge lapses of time, or changes of scene. Suppose we want to show, without expending too much footage, a person or group climbing a mountain or covering a great distance—and that the actual climbing or hiking is not the important thing in our minds, but that it must nevertheless be established: we can do this in two or three shots; first, starting blithely on the climb, swinging along energetically; second, close to the end of the climb, dragging slowly along, looking tired and mopping his (or their) brow. Contrasted tempos can also be used to indicate a rising or falling curve of emotion. Suppose that in place of the drug-store, it is the neighborhood speakeasy that Father is going to; and in place of Mother, let us use a raiding-squad. We can create quite an emotional effect by merely contrasting the tempos of Father's deliberate walk with the speeding police-car. Rightly done, such a sequence can build to a fine level of suspense: but it must be done expertly, for too many incompetent professionals have bungled it since Griffith first used it. Still, that is the way with most emotional tricks: properly handled, they are legitimate dramatic effects; overdone, or bungled, they make for comedy.

Timing

Here is a point that at once reveals the competence or incompetence of the director. How is each person's action spaced—or timed—with relation to the action of the other players? How are entrances and exits made?

Returning to our original example, let us suppose that Father reaches the drug-store, and is overtaken by Mother. How is she to enter the scene? The answer depends upon the effect we want to produce. Is she to surprise the audience, or is she to surprise only Father?

In either case, let us suppose that there are several people standing or walking about in front of the store. This will be natural, as well as dramatically useful. Now, if Mother is to enter surreptitiously, and pounce suddenly upon her errant spouse, she can do it in two ways. If she is to surprise both the audience and Father, she should enter the scene unobtrusively, near the rear of the scene, and pass behind the various "extras," coming suddenly forward to reveal herself unexpectedly to both the audience and Father. If, on the other hand, the audience is to be given an anticipatory chuckle, she should enter near the front of the scene, and pass in front of the "extras," for in a picture the commanding position is always that nearest the camera. In this case, she could hardly help being noticed by the audience. If it is desired to make her entrance immediately noticeable, but not so important as what she does after reaching Father, she should enter fast, and rush across the picture (crossing in front of everybody else) to Father. But if we want to attract the maximum attention to her entrance itself, she should stop for a moment, just as soon as she is well into the picture, and pause for a moment before hurling herself across the screen at Father. In extreme instances of broad comedy, she might, just after her pause, and just before rushing at Father, gesticulate wildly, though this is rather an obvious exaggeration. The pause, however, is important: it is like the moment's rest just before a crashing chord in a symphony: it focuses the attention on Mother, and heightens the effect of whatever action is to follow.

Timing is vital in scenes played by two or more players together, whether the scenes be played in intercut, individual close-ups or in a longer shot showing all the players. Acting is far more than merely action: it is a matter of action and reaction. As Conrad Nagel once said to me, "The best definition of acting and timing of action is Joe Jefferson's: 'When I talk, you listen; when you talk, I listen'. This sums up the whole secret of acting, for movement on the part of the player who, for the moment, is of secondary importance, will kill the scene, no matter how great the other player may be, nor how fine his acting in the scene may be."

Therefore, in our example, we must first decide whose scene it is to be once Mother reaches Father. If it is to be her scene, Father must not move too much after once registering his surprise; but if it is to be his scene, she should "freeze" while Father, as the saying is, "takes it big." This is an extremely difficult thing to manage with amateur actors, but it is too vital to neglect, for it marks the difference between an amateurish, home-made-appearing production and a smooth, finished picture. No matter what the scene may be, remember that it must as a rule be dominated by one or the other of the players. Decide whose scene it is to be, and direct it accordingly. Make the player who for the moment is of secondary importance realize that it is the other fellow's scene, and keep him from queering it. Give time for action and reactions, with brief pauses between to enable the audience to keep up with you, speed the action and reaction according to the tempo you have set, or wish to keep—and your scene, your sequence, and your picture will be all right.

◆

Many Features Scheduled

INDICATIONS at the moment are that more than five hundred feature productions will be made in Hollywood for the 1932-33 season. Approximately four hundred of these will come from not more than ten of the big producing companies, according to a checkup of the announcements from the various studios. More than one hundred are expected to come from the Independent producers who this year have one of the finest opportunities they have had in many years to place their product upon the market.

RKO-Radio is lining up a production drive in which executives are planning to launch fourteen feature productions within the next three months. David Selznick, production head, has announced that there will be no summer let-down, and that production will continue at high speed. From Universal comes the announcement of a production schedule that will run into many millions of dollars, and most of the major studios have approximately forty pictures on the schedule for delivery.

AMATEUR Club Activities

Los Angeles Amateur Club

A PROGRAM of unusual interest was furnished the members of the Los Angeles Amateur Cine Club at its May meeting held on Monday evening, May 9th. William Stull, A.S.C., associate editor of this magazine, prepared a special reel for the meeting, showing just what can be done by the amateur if he uses filters. It was quite a remarkable reel and gave much valuable information to the club members.

An added feature was the showing of a 35 mm. short feature which was furnished by the RKO-Radio studios, through the courtesy of Lloyd Knechtel, head of the special effects department of the studio. The picture was called "Humanettes," and was trick photography in its entirety. Mr. Knechtel, who photographed the picture, was on hand and told the members just how the picture was made. The meeting was held in the auditorium of the Hollywood Citizen-News, under the auspices of the camera department of the Hollywood Citizen Store. Mr. Ray Sebastian, head of the camera department, acted as host, and topped off a fine evening's entertainment with a buffet lunch.

◆

Amateur Players

THE Amateur Players, Inc., of Bayonne, N. J., are now at work shooting a comedy, tentatively titled, "All Wet That Ends Wet," which will be entered in the $1000.00 Amateur Movie Making Contest that is being conducted by the AMERICAN CINEMATOGRAPHER. The scenario was written by Paul Homer Kitchen. Bruno Tarzia will handle the photography. Alfonso Squeo is president of the club.

◆

Boston Cinamateur Club

ALTHOUGH only formed last January, the Boston Cinamateur Club, with headquarters at West Somerville, has thirty-two members, and is adding more rapidly. T. H. Patten is secretary of the club, which is the only one in Eastern Massachusetts.

◆

Greenbrier Amateur Movie Club

HAL MOREY, secretary of the Greenbrier Amateur Movie Club, of White Sulphur Springs, Va., writes us that the Greenbrier club is planning to enter a picture in the Amateur Movie Contest of the AMERICAN CINEMATOGRAPHER. This is one of the most active clubs in the East, having a membership of 62, although only organized shortly after the first of the year. An interesting bulletin, "The Spotlight," is published by the club. A mystery drama, "The Black Door," has just been completed by the club members, photographed by Mr. Morey. Very favorable reports have been made regarding it.

◆

Northeast Amateur Club

MEMBERS of the Northeast Amateur Motion Picture Club, of Philadelphia, are at work on a production, "Dr. Ricco," which is being filmed from an original story by C. J. Webster, Jr., president of the club.

◆

Star Feature Art Film League

A PRODUCTION, "Hansel and Gretel," is now under way in the Star Feature Art Film League of Arlington, N. J., with the photography in the hands of Edward J. Hayes. Rachel Caputo is directing and H. E. Rathbun is in charge of lighting.

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STOP AIMLESS "SHOOTING" *and* MAKE REAL MOTION PICTURES

Complete Scenarios which enable you to make perfect photoplays with your own group, family, friends or club are now available at a very reasonable price. These scenarios have been prepared by professional writers, directors and cameramen. Every detail has been carefully worked out. All you have to do is

DIRECT AND PHOTOGRAPH THE PICTURE

These scenarios are furnished for 400 ft. features or 100 ft. shorts. With each H. M. S. Scenario are included a scene numbering slate and a complete set of art titles on 16 mm. films, with full instructions.

Prices: 400 ft. Features, $15.00
100 ft. Featurettes, $6.50
Write for complete list of stories.

ART TITLES: Single exposed, double exposed on art back-grounds. Prices on request. EDITING: For pictures from our scenarios, $5.00. All other editing $2.50 per hour.

HOME MOVIE SCENARIOS, *Inc.*

1220 Guaranty Building, Hollywood, California

EQUIPMENT PRIZES . . .

to be given winners in the

AMERICAN CINEMATOGRAPHER

$1,000.00

Amateur Movie Contest

In addition to the four cash prizes, announced on the opposite page, the following prizes will be awarded by various equipment manufacturers and dealers:

The BELL & HOWELL COMPANY will also present two equipment prizes—First, a choice of a Filmo 70DA Camera, listed at $280.00, or a Filmo Model J. L. Projector, listed at $298.00. Second, a choice of any Standard Cooke Telephoto Lens, priced from $60.00 to $95.00. To be given to prize winners who made their pictures with a Filmo. The EASTMAN KODAK CO. will present a Model K Cine Kodak, with a f. 1. 9 lens, complete with carrying case, priced at $150.00, for the finest example of photography in an out-of-doors picture regardless of whether it wins a cash prize or not and without consideration of story subject. MAX FACTOR MAKEUP STUDIOS will present one of the famous Max Factor Make-up Kits, completely equipped, to the winner of first prize of $500.00. HOLLYWOOD FILM ENTERPRISES, INC., offers a Model B Cine Voice, Home Movie Talking Picture Machine, complete with carrying case, priced at $129.00, to be given to that person or Amateur Club, located in California, who enters the best 16 mm. or 9½ mm. picture from California, regardless of whether the picture wins a cash prize or not. In other words, the prize goes to California's best entry. This home talkie equipment may be attached to all projectors, either 16 mm. or 35 mm. It makes any projector a talking picture machine. HOME MOVIE SCENARIOS, INC., offers two prizes as follows: To the winner of first prize of $500.00, one Scenario (choice of entire group), one H.M.S. Matte-box, choice of any H.M.S. Filter, and one H.M.S. Scene Slate. To the winner of second cash prize of $250.00, one H.M.S. Matte-box and choice of any H.M.S. Filter. In case the picture winning first prize is made from an H.M.S. Scenario, an additional cash prize of $100.00 will be paid by Home Movie Scenarios, Inc. If second prize is made from an H.M.S. Scenario, an added prize of $50.00 will be awarded; and an added prize of $25.00 will be given winner of third prize if made from an H.M.S. Scenario. METEOR PHOTOLIGHT COMPANY will present the winner of FOURTH cash prize the following valuable lighting equipment: A Meteor Double Photolight complete with two 500 watt NERON bulbs, retail price, $30.00, a Meteor Photolight Tripod model, complete with NERON bulb, retail price, $18.00, and a Meteor Photolight Table model, complete with bulb, retail price $13.50. Value of prize, $61.50.

AND—MORE PRIZES WILL BE ANNOUNCED

YOUR OPPORTUNITY!

The AMERICAN CINEMATOGRAPHER now offers the greatest opportunity ever given the AMATEUR MOVIE MAKER to win recognition and cash. ¶ A total of **$1,000.00** in **CASH** prizes is offered by this magazine to the winners of the Amateur Movie Making Contest announced in the October issue. This contest is sponsored by the American Society of Cinematographers, an organization composed of the world's leading professional motion picture cameramen. If you want to win recognition, as well as cash, read the rules below and send your entry. (See opposite page for additional equipment prizes)

COMPLETE RULES OF THE AMATEUR MOVIE MAKING CONTEST

The American Cinematographer will present a prize of $500.00 for what its judges consider the best 16 millimeter or 9½ millimeter picture submitted in this contest. $250.00 will be given as second prize; $150.00 as third prize; and $100.00 as fourth prize, a total of $1000.00 in prizes.

This contest is open ONLY to AMATEURS. No professional cinematographer will be eligible to compete. It is a contest solely for the amateur, either the individual or the club.

The contest officially opens November 1, 1931. The contest ends at midnight of October 31, 1932. All pictures must be entered by the closing date or they will not be considered. Entries mailed or expressed bearing the date of sending will be accepted if they reach THE AMERICAN CINEMATOGRAPHER office after October 31, 1932, providing the date shows they were sent before midnight of October 31, 1932.

Pictures submitted in this contest will be judged upon photography, composition, direction, acting, cutting and entertainment value. And only silent pictures will be eligible for the contest. The judges, whose names will be announced later, will include outstanding and widely known Cameramen, Directors, Actors, Writers and a group of nationally known Motion Picture critics from some of the best known newspapers in America.

The decision of the judges will be absolutely final, and there can be no appeal from their decision. Announcement of the awards will be made as soon after the close of the contest as possible and checks will be mailed the winners.

Pictures may be submitted either by individual amateur movie makers, or they may be submitted by Amateur Movie Clubs. However, they MUST BE photographed on 16 millimeter or 9½ millimeter film. Accompanying each entry must be a sworn statement to the effect that no professional cinematographer assisted in the making of the picture. No pictures will be accepted which were photographed on 35 millimeter film and then reduced to 16 millimeter

This contest is open to amateurs and amateur clubs anywhere in the world, with the following conditions.

Only Bona Fide Subscribers to the American Cinematographer Can Compete

If you are a paid-up subscriber to THE AMERICAN CINEMATOGRAPHER you are eligible to enter the contest. If you are not a subscriber just send in your check for a year's subscription and you are eligible.

In the case of Amateur Clubs the following rules apply:

If a club with a membership of 20 or less wishes to enter a picture, the club will have to have a minimum of 5 subscribers among its members. Any club with more than 20 members will have to have a minimum of 10 subscribers among its members. For any further information you may desire, write the Editor of the American Cinematographer, 1222 Guaranty Building, Hollywood, Calif., or consult your photographic supply dealer.

IF YOU WISH TO ENTER THIS CONTEST AND ARE NOT A SUBSCRIBER, MAIL COUPON TODAY

American Cinematographer, 1222 Guaranty Bldg., Hollywood, Calif.

Enclosed please find Check, or Money Order, for $3.00 ($4.00 foreign) for which kindly enter my subscription to THE AMERICAN CINEMATOGRAPHER for one year:

Name..

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It is understood that this subscription makes me eligible to enter your $1000.00 Amateur Movie Contest.

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Now used in **96%** of all Motion Picture Studios **EVERYWHERE**

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Max Factor's Make-up Studios

HOLLYWOOD CALIFORNIA

Anderson Now Manager

THE active management of the Mitchell Camera Corporation of Hollywood has recently been taken over by Mr. Stanley S. Anderson of Beverly Hills, California, who has acquired a substantial interest in this corporation. Mr. Anderson is well known in the local financial center.

The Mitchell Camera Corporation will continue to operate as it has in the past with no change in personnel, with Mr. George A. Mitchell, technical engineer, in charge of research and plant activities. The corporation will continue its program of development and with recently added equipment is now in a better position to serve the industry than heretofore.

The Mitchell Camera Corporation according to announcement by its executives, is an independent corporation and is not affiliated with any other company, and no licenses have been granted for the use of its patents.

◆

Relative Values of Sound and Color

(Continued from Page 10)

It must be repeated, however, that the imperfections of sound and especially color renditions in this new art have been and are so far a serious handicap to properly employ sound and color synaesthesia to motion pictures.

At the same time, the author feels that scenario writers, directors, art directors and composers or music directors should not neglect to include into their cooperative efforts a study of this little known physio-psychological human property of synaesthesia.

The present decline of public interest in motion pictures is spurring all producing agencies throughout this industry into well nigh desperate efforts to increase so-called box office values, which are nothing else but the automatic reaction of the public to satisfactory and rising entertainment values and sense pleasures.

Every element contributing to such favorable public reaction must be, therefore, studied, and if possible employed and it is for this reason that this short analysis of synaesthesia is offered to the motion picture industry at large for consideration and study and don't forget, "You can and do see a tone and hear a color."

◆

Australia Launches Multi-Lingual Films

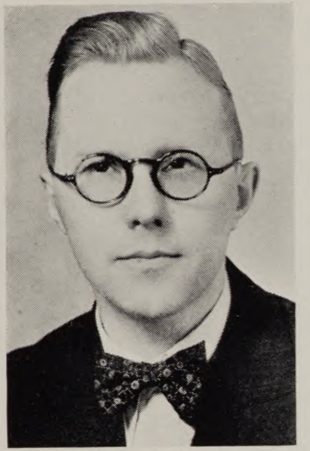
GREATER Union Theatres, Ltd., of Sydney, Australia, has signed a contract with Captain Frank Hurley, the cinematographer who made "Pearls and Savages," "Southward Ho with Mawson" and "Siege of the South," to produce a series of pictures for world-wide distribution, necessitating the recording of the accompanying dialogue in various languages. The first multi-lingual to be made in Australia will be entitled "Pearl of the Pacific," an educational film on the Lord How Islands. Also scheduled for early production are "Symphony of Steel," showing the opening of the Sydney Harbor bridge, and "From Tropic to Antarctic."

◆

Stars Are Keen Fans

MOST of the famous screen stars are like the postman who takes a walk on his day off, it is indicated by latest returns in the Hays motion picture preference poll, which shows that film celebrities are among the most ardent movie patrons of the country. They attend, not only to see themselves as others see them, but for entertainment and relaxation

Far Afield



W. E. Smith

WE OF Hollywood are prone to forget that there are pictures being made in other sections—sometimes pictures that are very unusual and pictures that require as much skill as any made in the studios where we have every facility at hand. Some of us might be very much surprised if we knew just what is being accomplished by cameramen in the far places, working, many times, with rather ancient equipment and under trying conditions.

The writer has just received word from Eddie Blackburn about one cameraman who is doing real things away up in Seattle, Washington. He is Wm. E. Smith of 2423 Federal Avenue, Seattle. Mr. Smith has recently completed an unusually interesting picture of Washington wild life for the State Game Commission. A total of 7500 miles was covered by Mr. Smith in making this picture. With a game warden, he started out from Seattle and crossed the Cascades by Snoqualmie Pass. Elk were photographed on that leg of the trip. Deer were shot in the northeastern section, in Stevens and Pend Oreille counties. Bird life was photographed in central Washington. There what is believed to be the first 35 mm. pictures of sage hens "strutting" in their natural haunts, were made. It took five days to get 150 feet, due to the fact that the birds strut only at the break of dawn. Mr. Smith says that the Eastern supersensitive film solved the problem there. Wild duck and all kinds of birds found in Washington were also photographed. The Game Commission wrote Mr. Smith that all the members were highly pleased with the film.—H.H.

◆

Optix Reorganizes

REORGANIZATION and expansion of the Optix, Ltd., Corporation, manufacturers of the Optix-Debrie single system recording equipment has just been announced.

Removal of the corporation headquarters from Inglewood to Hollywood and an inclusion of the Len Roos 16 mm. sound on film equipment, together with certain highly specialized medico-electric equipment, comprises a part of the new set-up.

Len Roos remains as chief of the technical staff, with Milton Anderson as general manager. The Board of Directors is made up of men of high professional ability.

Since the first announcement of the availability of the Optix-Debrie single system was made in this magazine two months ago, business contacts with more than twelve foreign countries have been made as well as a wide spread American market. World sales are in the hands of Harold S. Ryerson.

Professional Effects

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H. M. S.

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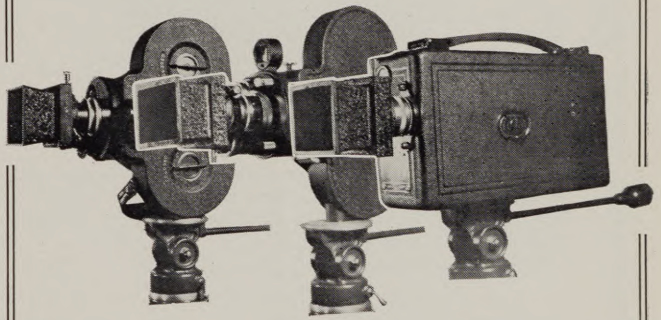

and HARRISON

H. M. S.

FILTER SETS

Professional Quality 2" Square Color and Effect Filters

◆

Much of the beauty of professional films is due to the use of special color and effect filters which, although commercially available, could not be used with 16 mm. cameras for want of a proper filter-holder. The H. M. S. matte box takes the standard professional two inch square glass filters. These provide not only the more familiar color-correction of the well known "K-series" of yellow filters, but also a wide variety of special effects, such as moonlight and night effects, fog effects, diffusion, and light and dark iris effects that have hitherto been impossible for the amateur cinematographer. The H. M. S. matte box is designed to take two of these filters simultaneously, permitting many combinations of color-correction and diffusion, color-correction and special effects, etc.

The H. M. S. matte box will fit any standard 16 mm. camera. It is mounted directly on the lens, and held in place with set-screws and special fittings, so that while in use it is rigidly in place, but instantly detachable. It can likewise be fitted to a number of semi-professional 35 mm. cameras, such as the Eyemo, de Vry, etc., and to still cameras whose lenses do not exceed 1½ inches in diameter. **It is important, in ordering, to inform us as to the camera, lens-equipment, and lens-mounts with which the matte box is to be used. Price $7.50.** A small extra charge is made in cases where the matte box is to be used with more than one lens, or where it is to be fitted to 35 mm. or still cameras or special lenses.

HOME MOVIE SCENARIOS, INC.

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Other focal lengths: 15 mm. to 3½ in.

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Cinecolor Starts

ANNOUNCEMENT that the laboratories of Cinecolor Inc., are on a production basis for the processing of both 35 mm. and 16 mm. motion picture film has just been made.

The Cinecolor Corporation represents a coalition of experienced technicians and modern equipment designed to meet the needs of both the professional and 16 mm. projection field.

An adequately equipped professional laboratory is prepared to deliver both 35 mm. and 16 mm. color prints, an announcement which should be of vast importance to the whole motion picture industry. The Cinecolor process embodies the best features, heretofore recognized as a part of the "bi-pack" system, with new and improved color print methods. The present plant capacity is in excess of 1,000,000 feet of prints per month, uniformity of release prints is guaranteed by those in charge.

The general management of Cinecolor is in the hands of A. L. McCormick, whose experience in the field is of years standing. The technical staff is headed by William T. Crespinel, who until recently held a similar post with Multicolor. Associated with Mr. Crespinel is William V. D. Kelley, whose name has been associated with the development of color processes for many years. Mr. Kelley is also chairman of the color committee of the American Society of Motion Picture Engineers.

The company is further fortunate in the association of Roy Hunter as a member of the Board of Directors. Mr. Hunter, as technical chief of the Universal Laboratories, needs no introduction to the industry.

Sales, advertising, and studio contacts will be handled by Harold S. Ryerson. Mr. Ryerson has had several years experience in the color field in this capacity.

◆

Ralke Heads Victor Animatograph Corporation's West Coast Branch

C. H. RALKE, well known in the 16 millimeter field, has been appointed in charge of the West Coast Factory Branch of the Victor Animatograph Corporation, manufacturers of the Victor cameras and projectors, whose main office and factory is at Davenport, Iowa. Mr. Ralke's headquarters are in Los Angeles.

While so many are talking about the depression and poor business conditions, Ralke smiling reports that business is rapidly speeding up, and predicts a continued upswing in the 16 millimeter field. Ralke for some time was in charge of the 16 millimeter sales for the National Theatre Supply Corporation in the California field.

◆

Detroit Studio in Tieup With 3 in Other Cities

METROPOLITAN Motion Picture Co., of Detroit, producers of industrial films under RCA Photophone license, has become associated with the Atlas Educational Film Co. of Chicago, the Alpha Motion Picture Co. of Cleveland and the Aeolian Co. of St. Louis, Mo. Each company retains its identity, but the four will cooperate on sales and production. Metropolitan recently moved into its new two-story building on East Grand Blvd.

◆

Clergymen Advised To Boost Good Pictures

CLERGYMEN should pick out good motion pictures and advise their congregations to see them, rather than spend their time panning the bad ones, according to the conference of the Evangelical church, just concluded at Baltimore.

The conference believes that would have more effect than any calling of attention to films which have been under the censor ban.

New Perambulator and Camera

(Continued from Page 16)

telephoto shot of an existing background, or a cinematic copy of an ordinary 8x10" still picture. The two images, which are produced by the two cameras, in exact register on the single strip of film, are kept in proper relationship by matting off parts of each picture, as in ordinary glass or matte shots.

Other items in the Bell & Howell exhibit were the new motor-driven "Eyemo," the Cooke "Speed Panchro" lenses, the B. & H. -Cooke "Varo" zoom lens, Cooke "Apermax" projection lenses, which work at speeds of f:2 and more, and a set of photographs and descriptions of the new automatic sound-and-picture production printer.

The Paramount Studio exhibited one of their regular blimp-and-rolling-tripod combinations, and an ingenious "baby crane," which, though capable of passing through a 24" door, can be raised to a height of eight feet, or dropped below the floor-level.

The Educational studios exhibited their Vacuum blimp, and an unusually practical perambulator.

The Fox Studio Camera Dept. exhibited its system of using fabric rather than solid blimps.

Spindler & Sauppe exhibited the new model "Leica" camera, the familiar Leica accessories, and the new photo-electric exposure-meter described elsewhere in this issue.

The meeting and exhibit were a decided success, and reflect the greatest credit upon Mr. Miller, who organized the affair.

◆

New Zealand Will Limit New Theatres

THE Government has found a way to check over-seating in New Zealand. That is by limiting the building of new theatres.

The authority to check theatre-building has been placed in the hands of the Minister of Industries and Commerce, who is authorized to appoint officers to control and issue licenses to exhibitors in localities where the erection of new theatres would be likely to result in "unreasonable economic waste."

These investigators will report on the normal requirements of each locality, on the quality of the films, the prices and the seating accommodations. Also they must decide whether or not the opening of new theatres would entail hardships on exhibitors already licensed.

GOERZ

CINE LENSES

KINO-HYPAR
f:2.7

It should be welcome news to cinematographers contemplating the purchase of a wide angle lens for amateur movies that a drastic price reduction has been effected in the Kino-Hypar f:2.7. Formerly sold at $57, its present price is $45. This includes finder lens when required. Its speed and unusually fine corrections ideally adapt this lens for all purposes of interior, sport and panoramic photography.

Goerz Effect and Title Device, enabling the amateur to create professionally artistic titles and a variety of effects has been reduced from $172 to $150. It is suggested as the ideal purchase to the camera club for the general use of all its members.

Literature on request.

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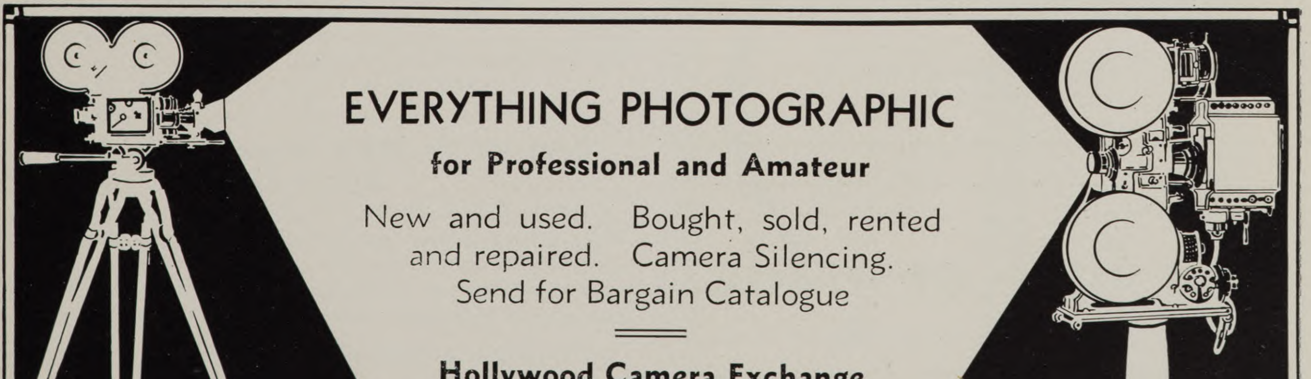
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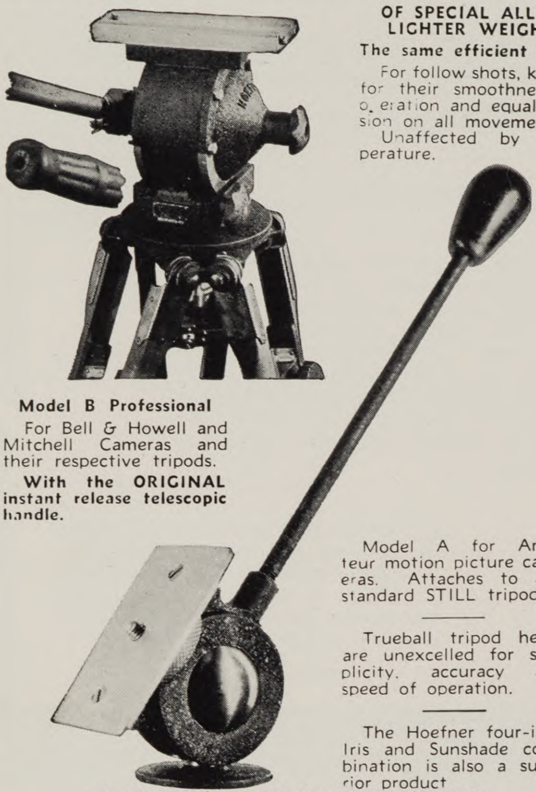

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TRUEBALL TRIPOD HEADS

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LIGHTER WEIGHT

The same efficient head.

For follow shots, known for their smoothness of operation and equal tension on all movements.
Unaffected by temperature.

Model B Professional

For Bell & Howell and Mitchell Cameras and their respective tripods.

With the ORIGINAL instant release telescopic handle.

Model A for Amateur motion picture cameras. Attaches to any standard STILL tripod.

Trueball tripod heads are unexcelled for simplicity, accuracy and speed of operation.

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Model 70-D Filmo 16 mm. Camera with 1", 2" and 4" lenses. Kodacolor attachment. First class in every respect. Want late model Eyemo, or cheap for cash.

JACKSON J. ROSE
c/o The American Cinematographer

Home Movie Fan

Robert Montgomery, M-G-M Star, with his Cine Kodak that he takes with him wherever he goes.
Photo by Wide World Photos.

◆

Engineering Aspects of Noise Study

(Continued from Page 12)

the Board of Transportation had us perform for it an extensive noise survey of subway and elevated lines. The study included the consideration of the type of road-bed, type of tunnel construction, type of elevated structure, type of rolling stock, etc., all with the thought that each link should be designed to achieve quiet conditions.

The noiseless typewriter is comparatively familiar to all but even it is undergoing modification to make it more silent. In talking picture work we have introduced the so-called noiseless recording to amputate the highly unnecessary scratch from film entertainment. Manufacturers of household equipment, such as electric refrigerators, have catered to the public demand by producing quiet machines.

And so on. I have tried to outline some engineering aspects of a large scale program for the elimination of noise. The program is an idealistic one but nevertheless admits of practical realization. As the parties directly responsible for bringing about improvements in material fields, engineers hold the fate of the program in their hands. They should realize the advantages of noise reduction in the way of increased comfort, health, and efficiency, and adopt as one of their fundamentals the precept of noise suppression.

◆

England To Have Woman Director in Auriol Lee

AURIOL Lee, well known as a stage producer, is to become a picture director and will do a feature for British International at Elstree, under the supervision of Alfred Hitchcock.

In addition to her British stage experience, she has done picture work in Hollywood, both with MGM and Paramount.

◆

Bulgaria Has 135 Cinemas

BULGARIA, according to figures made public by the Bulgarian tax authorities, had 135 motion picture theatres as of Dec. 31, 1931, with a combined seating capacity of 51,543. But 57 of the theatres are operated daily. The number of programs shown during 1931 amounted to 8,004.

S.M.P.E. Convenes

(Continued from Page 26)

(6) For a given wattage the area of the biplane staggered filament is reduced to about one-half that of a monoplane. This makes possible the manufacture of a series of line voltage projection lamps with much smaller light sources than heretofore realized.

(7) Biplane filament lamps as compared with monoplane types of the same source size present the difficulty of a greater heat problem due to their increased wattage. In order to prevent bulb bulging the temperature of the hottest spot on the bulb should not exceed 500° C.

Among the many other papers were: "The Duplication of Motion Picture Negatives," by J. I. Crabtree and C. H. Schwingel; "Short Focus Lenses for Projection With Translucent Screens," by W. B. Rayton; "Illumination in Projection Printing of Motion Pictures," by C. Tuttle and D. A. Young; "The Precise Measurement of Filter Factors and Photographic Reflecting Powers," by L. A. Jones and J. W. McFarlane; "Theatre Noise Problems," by S. K. Wolfe and J. E. Tweeddale; "Projection of Motion Pictures From Continuously Moving Film," by F. Tuttle and C. D. Reid; "Wave Form Analysis of Variable Density Sound Recording," by O. Sandvik and V. C. Hall; "Portable 16 MM. Sound Picture Systems," by H. Pfannenstiehl and R. A. Miller.

◆

Heading for Tibet

IF ANY reader of this magazine happens to be the owner of a short wave radio set and will get in contact with Station A.C.8-B.G. which operates on 40 meters, or 7,000 kilocycles, he will be able to talk with a member of the American Society of Cinematographers who is now somewhere in the interior of China, headed for Tibet.

The A.S.C. man is Jack Smith. He is now with an expedition that started from Hankow, China, on April 11. The expedition has one big truck equipped with sound recording apparatus; another loaded with food, and three more carrying gas, oil, camping equipment and camera equipment. Mr. Smith has 50,000 feet of 35 mm. negative film, 20,000 feet of sound film and 2000 feet of 16 mm. film, and he expects to bring out of China pictures such as have never come from there before.

The expedition left Hankow by train. They detrained at Sian. From there the party continued overland by truck. The route followed will lead them to Sienyang, Lichnan, Kienchow, Lungte, Tsingning, Tingsi, Chinksien, Lanchow, Kulang, Liangchow, Kanchow, Soo-chow, Ansi, Kuchengtze, Urumtsi, Tikwa, Kucha, Aksu, Pachow and Kashgar. After reaching the last named city, the plan is to strike out for Tibet.

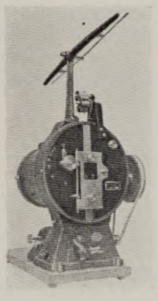
The expedition carries a short wave set and will be in daily touch with Shanghai. Any American amateurs who should succeed in picking up Mr. Smith's station undoubtedly will find much of interest to talk about. If any readers do make this connection, the editor of this magazine would be appreciative if they will write to us and pass along the news.

◆

France Is Asked To Subsidize Industry

M. LOCQUIN, director of the Fine Arts budget, has proposed that the French Government shall subsidize the motion picture industry, creating a national center of production.

According to his plan, a committee composed of Government representatives, producers, film artists, technical advisers, etc., would select all scenarios and supervise all production.



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16 MM. Optics

(Continued from Page 39)

as they appear at the aperture of a projection lens. Any change that would help fill up these spaces and thus make the source more solid would mean an increase in illumination.

Improved condenser design offers a small field for improvement which is applicable, perhaps, to many of the commercial machines. Even with a perfect condenser, however, one can do no more than to fill the projections lens with an image of the light source. The brightness of the source and the effective aperture of the system then determine the illumination. Increasing the aperture offers interesting possibilities that are yet to be considered. An f/1.5 optical system should give 75 per cent more light on the screen than the f/2.0 lenses now used; experience indicates that these theoretical increases are seldom attained, however, and that a figure of 50 per cent is much nearer the probable increase. The cost element enters into this situation to such an extent that an increase in aperture is not likely to be attempted in commercial practice until all possibilities of the light source have been realized.

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[3] Kellner, Hermann: "Can the Efficiency of the Present Condensing Systems Be Increased?" Trans. Soc. Mot. Pict. Eng. (Oct., 1923), No. 17, p. 136.

(Editor's note: This article printed through courtesy of the S.M.P.E. Journal.)

◆

Shadows

(Continued from Page 37)

We could have improved that scene by the judicious use of reflectors. By using a hard reflector and shooting in patches of sunlight here and there it would have created the impression of sunlight filtering through the leaves and the scene would again have been interesting when seen on the screen.

Always remember when using reflectors to reflect the light in a perfectly natural manner. Never reflect it from directly below an object. From in front and but slightly below or from the side is much better and gives a more natural effect.

Shadows are a great aid in the creation of atmosphere. In pictures dealing with a tropical locale it is a common dodge. A pair of lovers are in the foreground with the background usually the white wall of a tropical building, perhaps a hacienda. On this wall plays the shadow of palm leaves or of a giant cactus. Is not this proof positive of the locale of the scene? And who is to know if the objects casting the shadows were real or card-board cutouts?

Sustaining the dramatic tone of a picture is another important role in which the shadow is cast. In comedies, love stories and other happy vehicles there is never a great contrast between the highlights and the shadows. They are always photographed in a high key with a short tonal contrast.

Melodramas on the other hand have more violent contrasts between the highlights and the shadows. The shadows are more or less dull and heavy. There is just enough detail in them to prevent them from being black.

The whole phenomena of motion pictures is based on shadows. What we see on the screen is nothing but the shadow of a positive image which happens to be on a tiny strip of celluloid in our projection machine. Let us study shadows . . . if we do we will undoubtedly be rewarded with a more satisfactory result and it will be apparent when the final shadow of all our efforts is cast upon the screen.

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MORNING! . . . Official temperature for tomorrow . . . ninety-eight in the shade (if you can find the shade) . . . Among those who are not worrying about that . . . Clyde DeVinna . . . Newest assignment for Clyde is M-G-M's "Eskimo" . . .

Advance troupe off for Alaska with a schedule that would make even Howard Hughes (Hell's Angels) take notice. With the advance guard, sailing from Seattle last week, is more than a quarter of a million feet of Eastman Supersensitive negative which will contribute much to the beauty of this pretentious production.

What the Cameramen Are Doing to Keep Hollywood on Top

Rosher to Burbank

Charlie Rosher, whose international reputation was gained through his delightful photography of Miss Pickford, has completed his first production with Miss (Constance) Bennett at R.K.O. . . . Did he click? . . . News note . . . Charles Rosher has gone to Warner Brothers-First National Studios **with** Constance Bennett, where he is photographing her current picture for the latter company.

Fads, Fancies and Fish

Maybe it's the strain on the sets . . . maybe it's just the dog-gone lazy weather . . . anyhow . . . fad of the minute among a lot of the boys seems to be one that calls for very little energy and pays big dividends in fun and relaxation.

Merritt Gerstad is building a mountain lodge at June Lake, 'way up in the High Sierras above Bishop . . . (where fish are FISH) . . .

Arthur Edeson broke ground last week at Malibu Lake, where he's building a chateau so close to the lake he can cast his line right out his window. . . .

Couple of other fellows (names on request) are dickering with agents who sell lots at Big Bear and Arrowhead.

Down to the Sea in—Buicks

Frank Garbutt, of R-K-O, has taken a house for the season at Hermosa Beach and is commuting daily in his new Buick, which, with its special power plant, is capable of pulling the needle to sixty-five in second. Frank drives it in high . . . in twenty-seven minutes from the studio.

Rain

Ollie Marsh has been loaned by M-G-M to United Artists, where he is supervising the photography of "Rain" for U-A with Joan Crawford in the part made famous by Jeanne Eagels. Company is presently at Catalina Island. Harry Perry is shooting with Marsh, while Charlie Bohny and Kyme Mead are acting as assistants.

Another Thriller

"Kong" is the tag under which R-K-O sends its special production into work. Picture is similar to "The Lost World," which First National produced here about eight years ago. Eddie Linden is in charge of the camera work and has as his assistant Bert Willis.

And From the South Seas—

MAX DuPont thought he'd retired to lazy comfort in Tahiti—Doug Fairbanks thought differently—The answer—Max, who shot the exteriors in Tahiti, came home with the Fairbanks troupe and is shooting the interiors on the Fairbanks stages at United Artists Studios.

Powers With Doane

Len Powers is photographing the series of shorts being produced by Warren Doane at Universal. Len has been associated with Mr. Doane for many years . . . both formerly at the Roach plant in Culver City. George Bunny is Powers' assistant.

First on Second

Dick Tower, recently elevated to first camera at First National, has completed his first picture, "The Crooner," and turned in such a splendid job that he immediately drew another important assignment and the big bosses are giving him a big hand. Dick is seconded by Tommy Branigan, with Wesley Anderson as his assistant.

Merton of the Talkies

Al Siegler is photographing "Merton of the Talkies" at Paramount and is being seen on the golf course only "if, when and as . . ." That's the only really bad thing about being a good photographer . . . it **does** raise the very devil with your golf score. . . .

"Yo-lee-aye-eeee"

Another mountaineer of Hollywood . . . Harry Ensign, Superintendent of Paramount Lab, is spending his week-ends at his Lake Arrowhead home. When fishing season opened, a few weeks ago, Harry was out with rod and line long before sun-up. . . . His first "strike" came within two minutes after he'd started fishing, and when the pale pink of dawn cast its rosy glow across the ripples of the lake forty minutes later . . . Harry had landed . . . (Note—Blaisdell . . . YOU go ahead and finish this . . . my conscience simply won't allow me to repeat what I've been told . . . you know this might have been a good yarn, but NOT ONE got away. . . .

Eddie's conscience won't let him tell,
Although the yarn would ring the bell.
But who are we to storm a breach
From which did shrink this well-known peach
For telling tales that shriek of mirth—
Those fishy tales that reek of earth!

G. B.

Sharp Finishes the Widow

Well, not exactly that, but what we started to say is that Henry Sharp has completed photography of "The Sporting Widow" at Paramount and will be offered an assignment at another studio immediately. Henry's second at Paramount was Otto Pierce with Lloyd Ahern as assistant.

Take Off That Beard

When the horses of "The Four Horsemen" were just little colts . . . and long before the Famous Quartet had even learned to ride . . . a youngster came over to Metro from the old Biograph, and he's been there ever since. Johnny (they called him then) Arnold is the guy. Now it's John Arnold, head of the M-G-M camera department and President of the A. S. C. . . . somewhat gray about the temples . . . remembers all about X-back and static . . . (Maybe *that* made him gray). How long ago? . . . Gosh . . . we've GOT to be polite.

Ride 'em, Cowboy

T. D. McCord has created an enviable reputation as a photographer of action pictures. He has been selected by Leon Schlesinger and Sid Rogell to handle the camera on the first of a series which Mr. Schlesinger will produce for release by Warner Brothers-First National. Production is under way.

A Rock's a Rock

There's the old gag about the producer who uttered the classic "A Rock's a rock and a Tree's a tree . . . shoot it in Griffith Park." . . . Here's one that (we think) tops it. An independent producer (with a **very small** budget) was interviewing a cameraman who had been "at liberty" for a year or so. The cameraman was interested, but he wanted to know something about the story.

"It's like Grand Hotel," said the producer . . . "It all happens in **twenty-four hours"**. . . .

The cameraman was on his feet with his hat on . . . "Nix!" says the crank-turner, "I'm not high hat and I need the job . . . and I don't mind a five-day schedule . . . but when you guys chisel down to one day . . . I ain't interested."

Third for Premier

Bill Hyer is again at the camera for Morris Schlank in the third which he has turned out for Premier. Hyer's assistant is Bill Charney. Working at Universal Studios.

Hap Depew

Every time there's a golf turnament held by 659 . . . there's one bird who never fails to win a cup (or something) . . . Hap Depew, step right up! . . . At the moment the old putter is resting because Hap is plenty busy with the camera recording the antics of that energetic mob of youngsters who delight audiences under the Roach banner as "Our Gang"!

Cronjager Licks Dragon

Eddie Cronjager has finished the camera work with Richard Dix in the R-K-O feature "Roar of the Dragon." His assistants were George Discant and Harold Wellman, while second work was handled by Harry Wild and Joe Biroc.

But Tover's Isn't

Another to finish one at the R-K-O plant is Leo Tover, who completed camera work on "Is My Face Red?" . . . Seconds were Russ Metty and Milton Krasner with the assignments to Willard Barth and Irving Glassberg.

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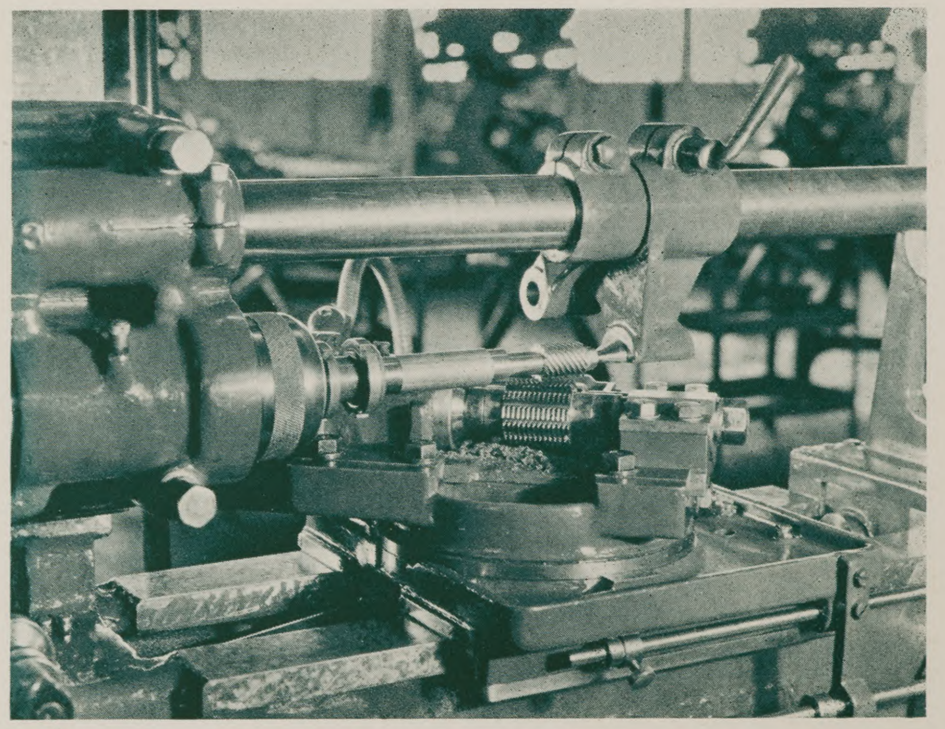

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